REPORT RESUMES

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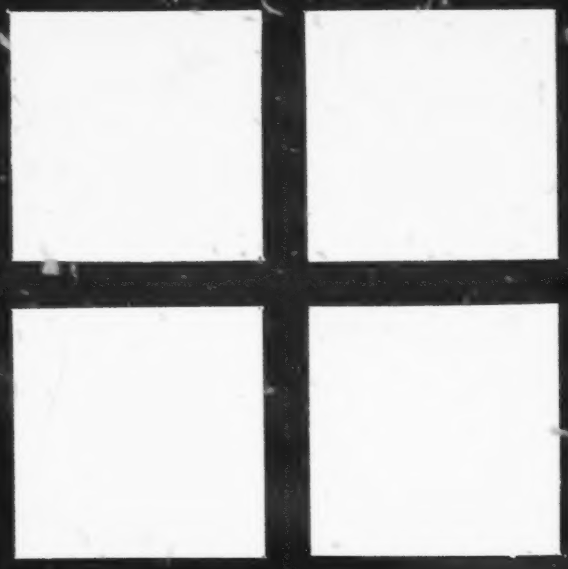

profiles of significant schools

schools without walls

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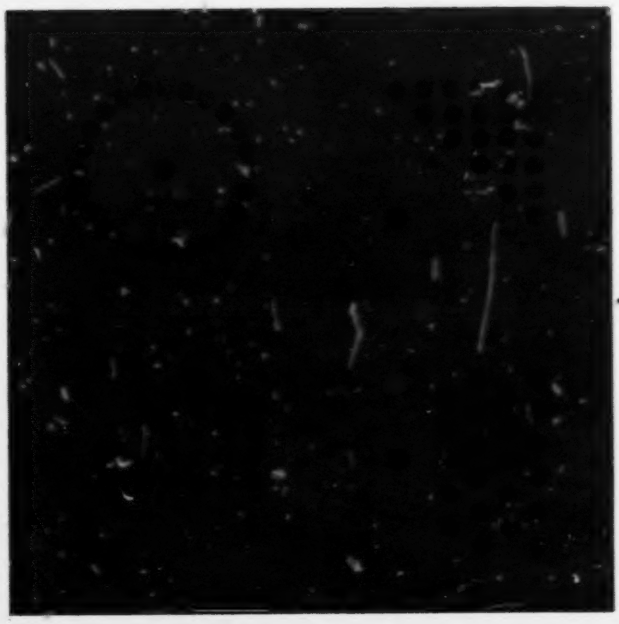

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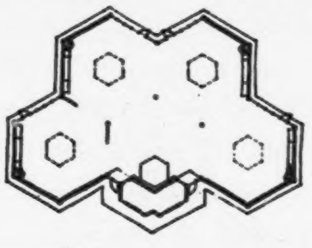
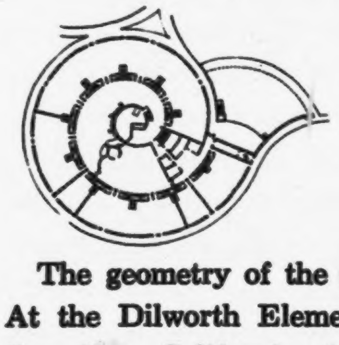
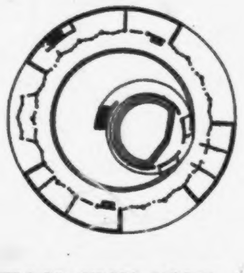
SCHOOLS WITHOUT WALLS

The continuing effort to devise educational containers which mold themselves to the fluid activities within, instead of the other way around, has led to a new and burgeoning phenomenon in schoolhouse architecture: the school without interior partitions. Dubbed "open-space schools" by educators and architects, these schools are precisely that—packages of unbroken space containing anywhere from three to five regular-size groups of children and their teachers.







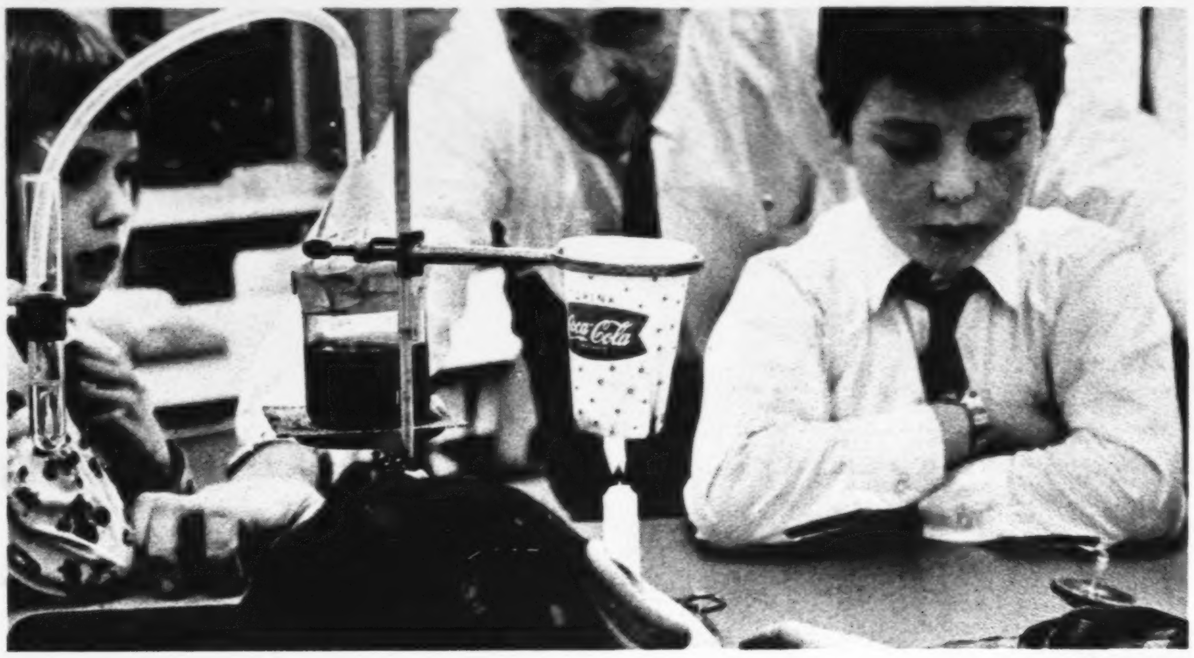
The geometry of the space may vary. At the Dilworth Elementary School in San Jose, California, the so-called "big room" is square. The Granada Elementary School, some 50 miles to the north, houses its open space in clusters of five contiguous hexagons. The Valley Winds School in St. Louis is a volute, a snail-like spiral.

Whatever the shape of the package, the contents are much the same: an educational process unbound by the barriers built into the conventional schoolhouse with its rows of standard classrooms. The major aim in these open-space schools is to provide an environment which encourages greater interaction between teacher and pupil, and between teacher and teacher. There are no partitions to fragment learning by dividing teachers, children, and subject matter into tight standardized compartments. And there are no halls to funnel children from compartment to compartment at the arbitrary dictate of a bell. Each child finds his own place, creates his own path.

As John I. Goodlad, professor and director of the University Elementary School at the University of California, Los Angeles, points out: "Children are different, much more different than we have up to now recognized. . . . The usual fourth-grade class contains children achieving at second, third, fourth, fifth, and sixth grades in some aspects of their schoolwork—and even occasionally above

and below these levels." In individual subjects, the spread in achievement may be even greater. Fifth-graders commonly read, for example, at levels ranging all the way from the second or third grade to the ninth or tenth.

And what is true of the class is true of the child. He "... can be in the fifth grade for arithmetic computation, the sixth for arithmetic reasoning, the seventh for spelling, the eighth for word meaning, the ninth for paragraph meaning, and the tenth for language—and yet be officially registered in the sixth grade. In the same class is Jean, whose scores range from low third to high seventh; Bill, from high second to low fifth; Pat, from fourth to tenth.... Children are downright ornery. They refuse to grow up all of a piece."[1]



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An open-plan school cannot make a child less "ornery." It *can* make it easier to mesh his schooling with his stubbornly piecemeal growth. A few such schools house—at least for the moment—classes that are, for all practical purposes, self-contained. But in most cases, the disappearance of walls has been accompanied by (if not indeed stimulated by) the appearance of less rigid patterns of teaching and learning: nongrading, team teaching, or both. At the very least, concentrating greater numbers of children and a greater reservoir of teaching talent in the same space simplifies the logistics of tailoring instruction to the needs of the individual child.

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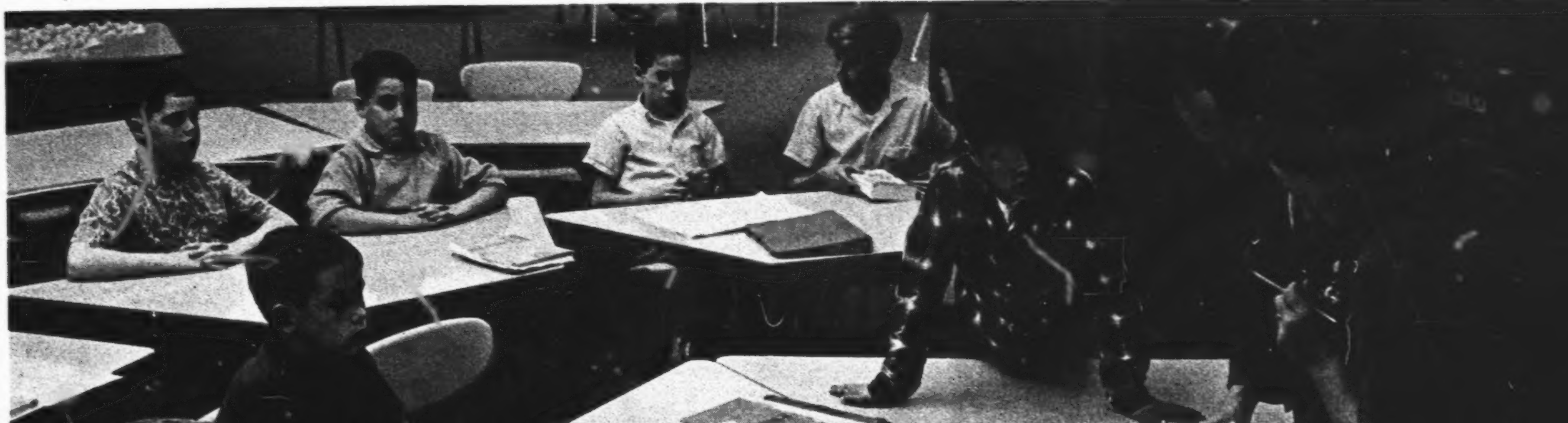
[1] Goodlad, John I., "Meeting Children Where They Are," *Saturday Review,* Vol. XLVIII, No. 12 (March 20, 1965), p. 57.

A nine-year-old with a head for figures like Bernard Baruch's may be a deadhead when it comes to tangling with a dangling participle. He may play three instruments by ear and be deaf to the subtler distinctions between French vowels. However uneven his attainments, there is a group within the open room working on his level in each subject, and a teacher to go with it. If he is a slow learner, he may stay with the same group for months. If he learns rapidly, he can move from week to week to a group at a more advanced level of achievement. When he moves, the move is an easy one: around a cabinet or across to another cluster of pupils a few yards away. There is no need for adjusting to a new teacher, new classmates, a different room.

And the teacher, stripped of the four-walled fortress about him and his 30 subjects, is no longer the solitary ruler of a sovereign domain. Forced into close association with his colleagues in the open classroom arena, he soon finds it natural and logical to work as a member of a team. The space itself leads firmly toward joint planning, the pooling of talents, the intelligent division of time and tasks.



CLOSE-UP OF A BIG ROOM The prototype of the jumbo classroom is the "big room" at the Dilworth School in San Jose, California. Though not the first venture into educational open space, Dilworth's big room was a bridge between isolated earlier examples and the current elaborations on a now-accepted theme. The success of this experimental unit—designed by Kal H. Porter & Associates and now in its third year of operation—has left its mark on dozens of schools already built, and dozens more still to come. In California, where schools go up at the rate of one a day and trends show [redacted] corresponding celerity, an estimated 75 per cent of all school construction planned in the post-Dilworth era includes some open teaching space; 20 per cent of the new schools contain nothing but.

Dilworth itself falls into the former category. Nominally a K-6 school, it has rejected grades in favor of performance groupings, and relies heavily on team teaching to guide youngsters through the open-ended curriculum at their own pace. But this advanced program is quartered for the most part in conventional classrooms, some paired with an operable partition between. The exception is that section of the school where the equivalent of four ordinary classrooms is fused into a single unit. This space, which stretches free and clear for 3,840 square feet, is Dilworth's big room.

Not surprisingly, the most striking impression it makes is one of sheer size: the room is really big. The carpeting deemed necessary (or advisable) to soft-pedal the patter of 100 pairs of little feet and the scraping of 100 chairs is a sea of tan tweed dotted by islands of furniture, with a large, uncluttered central space in which all the children can assemble. But if size is the first impression made by the big room, the more enduring impression is one of vitality and *esprit de corps*. "This is not a classroom," one visitor noted. "It's a community."

Because the space permits great freedom in deploying teachers and pupils, it lends itself readily to whatever innovations in program or schedule the staff thinks appropriate. In its three years of existence, the big room has seen all kinds of arrangements tried. In its first year, the big room was occupied by second- and third-graders; the next year, by third- and fourth-graders. At one time, it had as many as 140 children—which turned out to be about 40 too many.

This year, the big room houses the equivalent of four normal-size classes: four teachers and 110 eight- to eleven-year-olds. The youngsters, who would normally be fourth- and fifth-graders, are assigned by reading-achievement level to one of four basic groups, each occupying a home station in a different corner of the room. These home groups are designated by the color of their chairs—red for fast-moving children reading on a fifth-grade level, yellow for students reading on a fourth-grade level, and so on. According to Mrs. Jan Goss, Dilworth's principal, this color coding helps bring organization to a setting in which such time-honored appellations as "all fourth-graders" and "Miss Thompson's group" are no longer relevant. However, the children strike out from their home base and join other performance groups as they move from subject to subject.

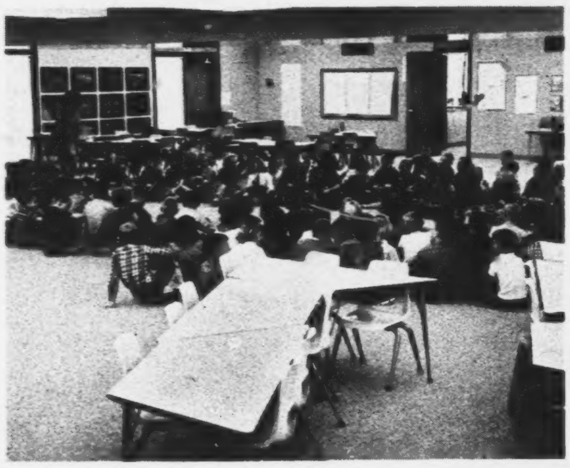
For the teachers, each day's work is likely to end in a planning session. Formal meetings with the principal and the adjustment-remedial instructor are regularly scheduled twice a week after school, and countless other planning sessions take place casually throughout the school day as two or more teachers, free from classroom duties, have an opportunity to meet together. These meetings, both formal and informal, are also the principal means of evaluating pupil performance and deciding who should be shifted to what group.

Since the Dilworth faculty believes that the leadership of a group should and does change with the situation, the big-room team works on a co-teaching basis, with no team leader. The responsibility for large group instruction rotates every 10 weeks, each teacher taking charge of lessons in a given subject. Daily schedules are changed every three months.

A typical day in the big room at Dilworth is organized as follows:

8:30 opening exercises.

Children gather in the center of the room for morning exercises conducted by one teacher; then report to their home stations for attendance taking and collection of milk money.

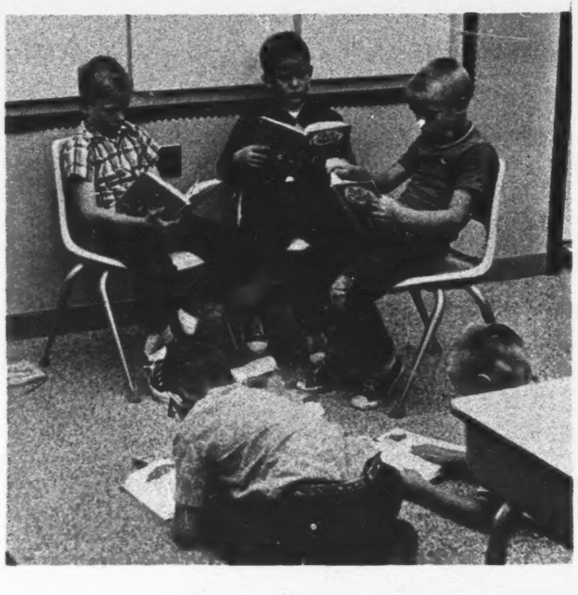


8:40 language arts.

Some children stay in their home stations; others join groups in other sections of the room. (Those who move take along their books and papers, which are stored in tote trays under the home-station tables.) All four groups work separately. One may have a lesson in public speaking; another, note taking and outlining; a third, creative writing; and the fourth, research and reference skills for which they may spill over into the library which is next door to the big room.

9:00 reading.

The children regroup, each going to his assigned station. Usually this will be with his home group, but if his achievement has changed in any direction since his home-station assignment, he may go to a group in another part of the room. Since an outside teacher, the school's adjustment-remedial instructor, takes charge of youngsters reading at a sixth-grade level or higher for accelerated work, one member of the team is free. She takes half the children to the library where she supervises their seatwork and gives special help to those who need it, leaving the other three team teachers to work with small groups reading at six or more levels. (In some groups, individualized reading texts are used.) After 30 minutes, these groups move to the library for seatwork, and the children in the library come back to the big room for their reading period.



10:00 recess.

Children may go to the library or playground, or to the central patio for a snack.

10:20 language arts.

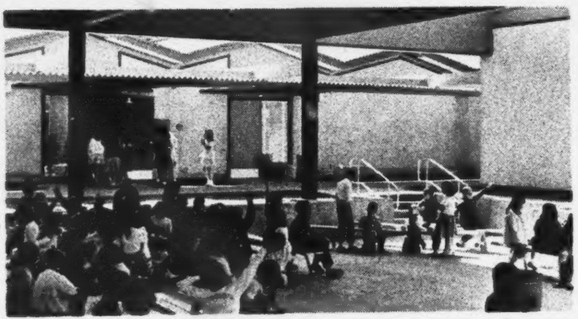
Children return to their home stations for a grammar lesson. Material is taught at levels adjusted to the group, each of which is divided into two or more subgroups.

10:50 social studies.

The entire population meets in the center of the room for a 20- to 30-minute presentation by one teacher. The large group lesson is followed up by work in small groups organized according to achievement level. One group is taken to the adjustment-remedial room off the library for remedial work. The other three groups all work from programed texts before embarking on different activities. The top group may do research and report writing, while a less advanced group acts out or discusses some of the concepts presented during the lecture.

11:45 lunch.

In good weather, children eat in the central patio. In bad weather, they stay in the big room.



Vocabulario

12:45 spanish.

Three teachers from the main building and a parent volunteer come in to give the children Spanish instruction. Two teachers from the big room cover the classes of the visiting teachers; one is free; the fourth takes a group of youngsters to a nearby room for science work.

1:15 spelling.

The three groups in the big room go to their home stations for spelling, which is taught, like grammar, according to group level. (The fourth group continues its science work during this period.)

1:45 mathematics.

Each child moves to the station where instruction is being given at his performance level. (He may also move during the period if a teacher feels he is ready to join a group doing more difficult work.) A fifth group is taught by the adjustment-remedial teacher, who takes them to the library's small-group room for special remedial work.

2:40 physical education.

Big room children and teachers are joined on the playground by two classes from the main building. Children are grouped by size and athletic skills, a single teacher in charge of each group.

BUT ISN'T IT NOISY? It is easy to see how an open space like Dilworth's big room contributes to more flexible programing and more freedom for teachers and students alike. It is not so easy to see how such an open space avoids extending an invitation to chaos as well, given upwards of 100 children pursuing half a dozen activities, from poetry writing to public speaking, in the same place at the same time. Yet the typical elementary schoolroom—full of sound, movement, and varied activity—harbors much the same potential problems that lurk in open spaces four times the size. Teachers have been dealing with these problems for years.

Outside the schoolhouse, experiences with open space are commonplace. The bank customer transacts his confidential business with one of the 10 officers in an executive bull pen while all around him other officers at other desks frown over stacks of paper, murmur into dictaphones, or confer confidentially with other clients. Typewriters clatter, telephones ring, people come and go. But none of this is particularly disturbing. It is just the expected background for the activity at hand. The same phenomenon occurs in large offices, in public waiting rooms and lobbies, and in restaurants.

In fact, it was the comparative privacy found in a crowded restaurant that inspired the development—a year ahead of Dilworth's big room—of a completely open, four-classroom addition to the ungraded Lewis Sands Primary School in Chagrin Falls, Ohio. As Dr. Robert M. Finley, then superintendent of schools at Chagrin Falls and now in Barrington, Illinois, tells the story:

"The idea for the 'Little Red Schoolhouse' came about at dinner one evening. Dalton & Dalton, the architects, had invited the board members and me to a restaurant in Cleveland in order to make some plans. As we sat at a long table in a rather crowded candlelit dining room, we discussed the many facets and details pertaining to the ultimate erection of the new building.

"Suddenly a thought hit me. I noticed

that even though we were in a large dining area, with many other groups eating and chatting away, we had not (at least I had not) heard the other noises or chatting in the room. Nor did anyone else at our table seem bothered by the other sounds. I stopped and listened for a moment and heard other people talking, dishes rattling, and music in the background. I asked the others at the table if they had noticed that we weren't bothered in our discussions....

"If we had a money problem, which we did, why couldn't we save money by eliminating the interior partitions and substituting movable furniture? The architect assured me that we could.... But could we work it educationally? Food for thought, and I couldn't wait to get to the office the next morning to work it out."

Eliminating the interior partitions did work out educationally, at the Lewis Sands School and elsewhere, because the open school capitalizes on the adaptability of people instead of relying wholly on the manipulation of architectural elements.

Teachers who have worked in open settings report that in the beginning children, especially children who are used to a self-contained classroom, tend to watch what nearby groups are doing. But their interest soon wears off unless the competing activity is particularly attractive—or distractive—in which case the temptation can be removed by applying a little common sense.

In most cases, scheduling so that one group of children is not playing rhythm instruments while other groups read is enough. In others, it may be more practical to shift some activities to another room, as at Dilworth where the adjacent library frequently serves as an outpost of the big room.

At the Lewis Sands School, if one teacher wants to stage a play with his group while a neighboring group studies math, he simply draws a curtain. Sound, the teachers say, is no problem, except when it is unexpected (a child drops an armload of books) or when it is dissimilar to other sounds in the room (singing instead of talking). The Lewis Sands School is not carpeted. In open spaces that are, many sharp noises—even dropped books—are muffled enough to blend into the normal background hum.

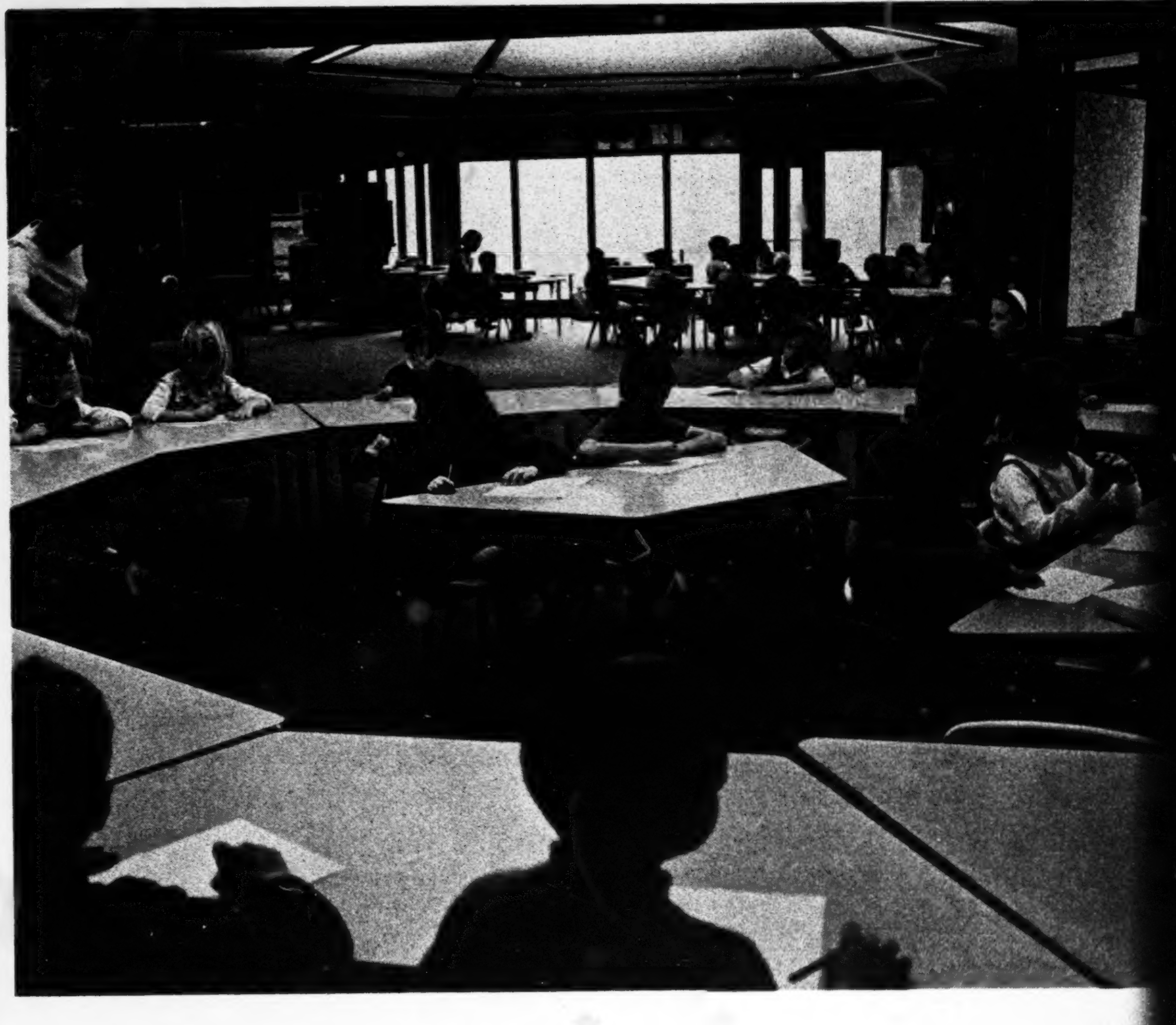
Carpeting is just one of a number of physical devices that can be used to control noise and other distractions in an open school. But the main ingredient in the success of these open spaces is simply that teachers and students quickly recognize and adjust to the situation in which they find themselves.

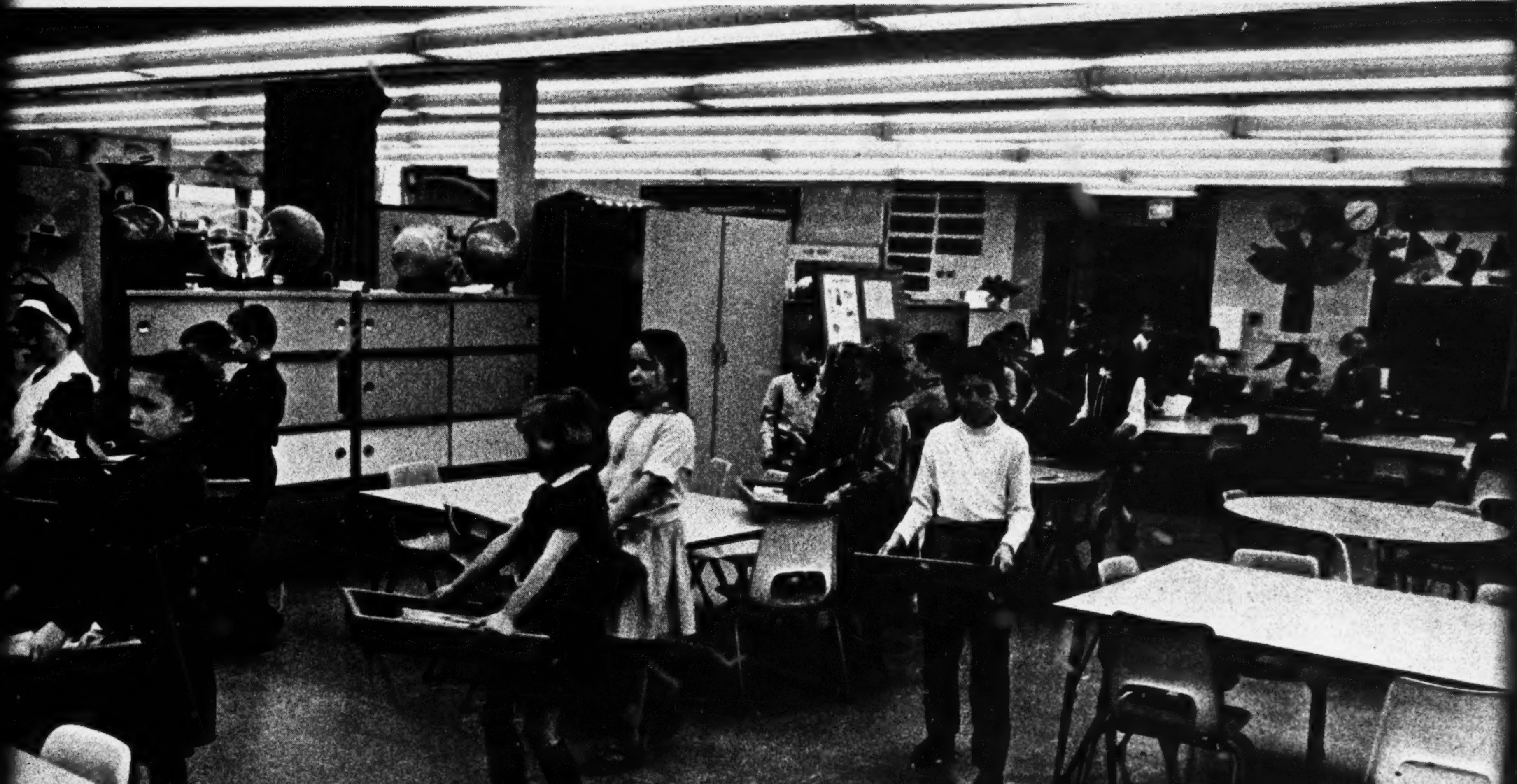
When two teachers are working side by side, each modulates her voice to a level calculated to reach the children she is talking to without spilling over to the neighboring group. And she does this as naturally as she would in a restaurant where she wished to be heard by her companions without being overheard by the couple at the next table. The children, barring occasional outbursts, follow her lead, speaking for the most part as—if not when—they are spoken to. By contrast, the teacher in a self-contained classroom, confusing visual privacy with acoustic privacy, may pitch her voice to a level that readily carries Latin declensions through a concrete block wall to the Spanish class next door. (Although the generally accepted criteria for acoustic separation between classrooms is 40 decibels, of 37 schools where sound measurements were taken for EFL's Technical Report #1, *Acoustical Environment of School Buildings,* not one measured up to that standard. The average sound transmission loss between fully enclosed classrooms was only 28 decibels.)

Another factor that makes it possible for varied activities to flourish simultaneously in an open room is the human capacity psychologists call "selective inattention." People who are interested in what they are doing screen out—often unconsciously—stray sights and sounds that might otherwise impinge, whether the distraction is a spelling lesson in a nearby teaching group or, as Dr. Finley noted, background music in a restaurant. This is especially true when the sights and sounds are familiar and expected: tuning out a hard-fought spelling bee in a candlelit café, or strolling gypsy players in a schoolroom, would be considerably more difficult.

A relatively high level of background noise like the generalized hum of activity heard in an open teaching space can help to cover up individual sounds that might be irritating. The principle is often applied by acoustical engineers who deliberately introduce noise (usually from air-conditioning equipment pitched to voice-frequency level) to provide an ambient sound level capable of masking other, more noisome noises.

How this works in practice is illustrated by Mrs. Schneider, who was shifted to a conventional classroom after teaching for a year in Dilworth's big room and is "itching to get back." She remarks that the move has altered her teaching approach; she is stricter, more irritable. "In the big room," she explains, "we could allow the children a lot of freedom because there was so much going on all the time we just didn't notice or mind if they were noisy. Now I notice everything."





THE WALLS COME TUMBLING DOWN

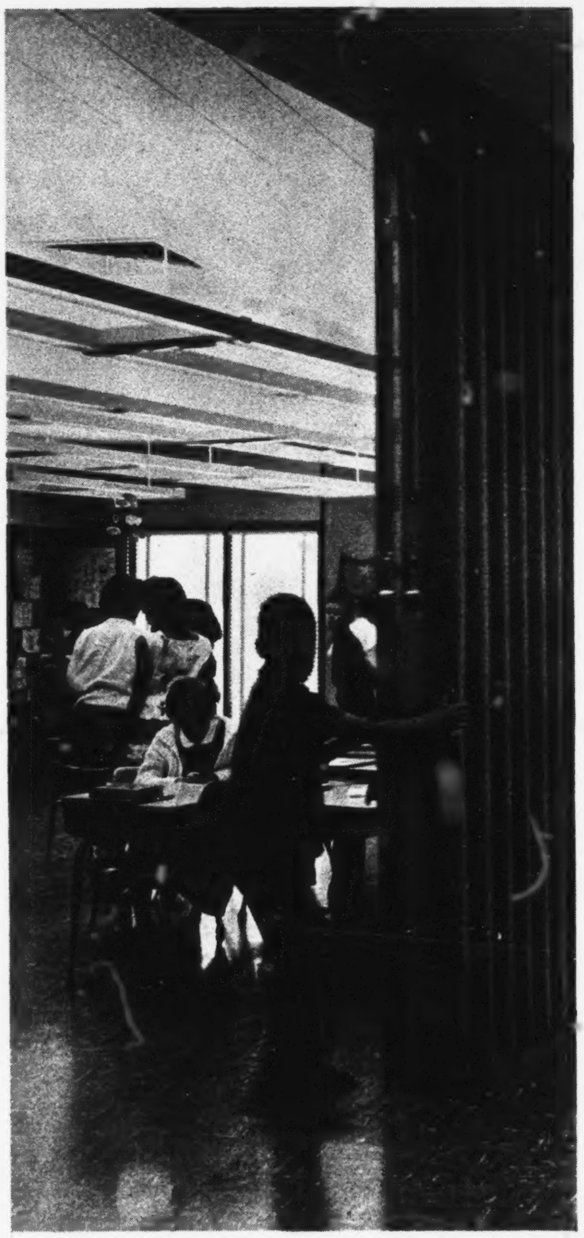
If Mrs. Schneider had been told, say 10 years ago, that in 1964 she would be teaching in a glorified one-room schoolhouse — and liking it — she would quite simply not have believed it. For everyone knew then that a proper schoolhouse contained many rooms, each filled with 30, or preferably 25, children and one teacher. "Open space" had no place in the schoolman's lexicon, unless perhaps in reference to playgrounds.

But then his lexicon did not include nongraded schools, team teaching, large and small group instruction, programed learning, independent study, or instructional television, either. Audiovisual aids still meant pulling down the blinds and hauling in a projector for 20 minutes of scratchy film and wheezy sound track.

Now, these still-new teaching techniques and technologies are playing an expanding role in the educational scheme of things, and the schoolhouse is being forced to get out of their way. In the drive for schools better equipped to accommodate newly fluid arrangements of people and time, and better able to respond to the certainty of change, the walls around the classroom box have become one of the prime targets.

Some schools assumed that if the interior partitions were more intelligently arranged to begin with, defining enough boxes of the right kind, future program changes could be taken care of by rearranging the people within them. The partitions themselves would shift over long periods of time, if at all. This approach, which might be labeled flexibility through variety, is used by schools like the Estabrook School in Lexington, Massachusetts (formerly Grove Street Elementary School),[2] and the nearby Wayland High School,[3] whose team-teaching programs are housed in a variety of spaces designed for specific teaching purposes — large lecture halls, small conference rooms, and spaces for independent study, as well as conventional classrooms.

More often, however, flexibility has been thought of as the ability to rearrange partitions. In loft-plan schools, the space is segmented by partitions which can be taken down and re-used somewhere else if new kinds of subspaces are needed. (Architect John Lyon Reid's pioneering Hillsdale High School in San Mateo, California[4] has been almost totally revamped in the nine years since it was built.) This scheme works very well when changes in program and space needs take place slowly, over a period of months or years.



But many educators and school architects have come to feel that if a movable partition is good, an instantly movable, or operable, partition is better. The operable wall is as routine a fixture in today's school as the blackboard. (Rough estimates indicate that over 2.5 million linear feet of operable walls will be installed in elementary and secondary schools by 1975.) And, frequently, schools use both operable and demountable walls to combine immediate and long-term convertibility.[5]

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[2] See EFL's *Profiles of Significant Schools: Schools for Team Teaching.*

[3] See EFL's *Profiles of Significant Schools: High Schools 1962.*

[4] See EFL's *Profiles of Significant Schools: Hillsdale High School, San Mateo, California.*

With all this juggling of walls in an effort to make form follow function, it was inevitable that someone should think of leaving the walls out altogether. For while it is often true that special functions need special spaces, it is also true that spaces can be made special not only by their size or shape but by what goes on in them—the people, equipment, and activities assigned to different areas at different times.

The first schoolhouse to draw national attention by rejecting interior walls was an elementary school in Carson City, Michigan.[6] Back in 1957, Carson City's planners decided they wanted a team-taught school. They also decided to dispense with conventional-grade organization. That meant teachers would be working together, not separately, with groups both larger and smaller than the quota for a standard-size classroom. But instead of providing matching big, little, and medium-size spaces, they simply combined the equivalent of four classrooms into one large area. Children roam freely through this space, grouping and regrouping as the teaching program dictates. The area has no walls. But it does have a central plumbing core which interrupts the open space.

The next few years saw other attempts to break down, or at least chip away at, classroom walls. At another of architect John Lyon Reid's schools, a loft-plan high school in Andrews, Texas, doors to the corridor became openings 10 feet wide.[7] In Saginaw, Michigan, two middle schools designed by Caudill, Rowlett & Scott shed the walls between their classrooms and the corridor, which could then serve as a multipurpose common area shared by several classes.[8] Architect Alden Dow's Delta College, also in Saginaw, carried this idea a step further by expanding corridors to classroom width so that the resulting concourses can double as lecture-seminar areas.[9]

The next real extension of the open-space concept pioneered at Carson City, however, was the Little Red Schoolhouse addition to the Lewis Sands School in Chagrin Falls. The space has physical shortcomings, the most serious being the lack of carpet to deaden noise, but it functions well educationally. And it does so without walls, without a central core, without any barriers to the free flow of space and people.

Dilworth's big room puts a period to this first stage in the saga of open space and begins a new chapter. For the big room has spun off a whole new generation of open schools which bear about the same relation to Dilworth that Dilworth bears to Carson City.

These second-generation schools come in shapes ranging from straightforward rectangles to amoeba-like free forms. Their programs differ and so does their success in capitalizing on the flexibility afforded by open space while minimizing its potential disadvantages. But they are alike in several ways.

Unlike the Lewis Sands School's Little Red Schoolhouse, which is an addition, or Dilworth's big room, which is only one unit in a larger complex, the newer open schools are wholly committed to open space. There are the usual special-purpose areas—library, administrative unit, perhaps a combined gym-assembly-dining space—but academic areas are completely open. Instruction takes place in self-contained clusters rather than self-contained classrooms.

At the same time, most of these schools avoid overcommitment to open space as the proper setting for all educational programs for all time. By providing for the installation of partitions if and when they are wanted, they extend the flexibility of the space beyond the options immediately available because of the absence of walls. If the teachers decide they need a separate, fully enclosed area for some purpose, they can have it. If changing educational programs and procedures suggest a step toward self-containment in all or part of the school, the step can be taken easily and economically.

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[5] See EFL's *SCSD: An Interim Report.*

[6] See EFL's *Profiles of Significant Schools: Schools for Team Teaching.*

[7] See EFL's *Profiles of Significant Schools: High Schools 1962.*

[8] See EFL's *Profiles of Significant Schools: Two Saginaw Middle Schools, Saginaw Township, Michigan.*

[9] See EFL's *Bricks and Mortarboards.*

Physically, then, the second-generation open-plan schools are more sophisticated than their predecessors, boasting a number of architectural features designed to make the multiclass cluster function more efficiently.

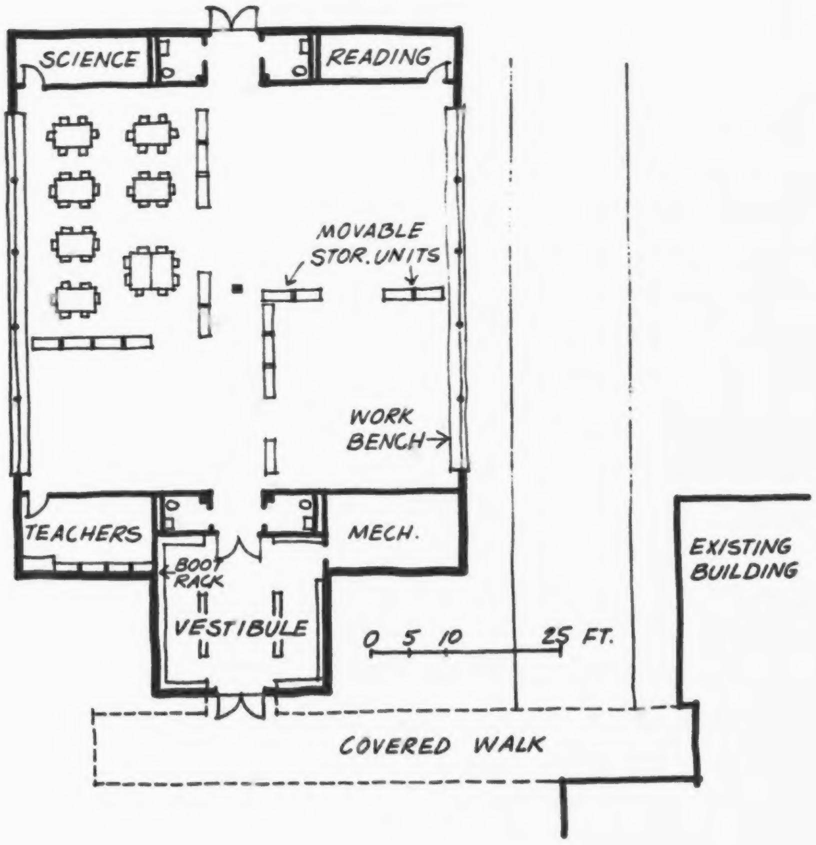
All of these schools are carpeted. The success of the carpetless open addition to the Sands School seems to be the exception to the rule that carpet is a must for this kind of space. Teachers in open schools elsewhere are unanimous in insisting that without this sound-absorbing floor covering, the space would simply be too noisy to work in. And carpet is helpful when large groups assemble. With it, the children can sit on the floor; without it, their chairs would have to be assembled, too.

Another feature common to the newer varieties of open space is more of it. Adding the equivalent of an extra classroom to the space in the open cluster adds to the distance between groups and reduces the risk of their interfering with one another. It also makes more free space available for large group instruction, special programs, and other group activities.

In addition, many of the schools supplement the open classroom cluster with separate special-purpose areas of various types and sizes. These adjunct spaces help reduce the need for careful scheduling—which imposes its own brand of inflexibility—by providing a place to isolate noisy or messy activities, or those that require a great deal of moving about. They are also useful for certain types of small-group instruction, or work with individual students.

The open-plan schools shown on the following pages illustrate how these refinements on the basic theme have been incorporated in a diverse group of schools.

a portfolio of open plans



Lewis Sands Primary School, Addition
Chagrin Falls, Ohio
Chagrin Falls Exempted Village Schools

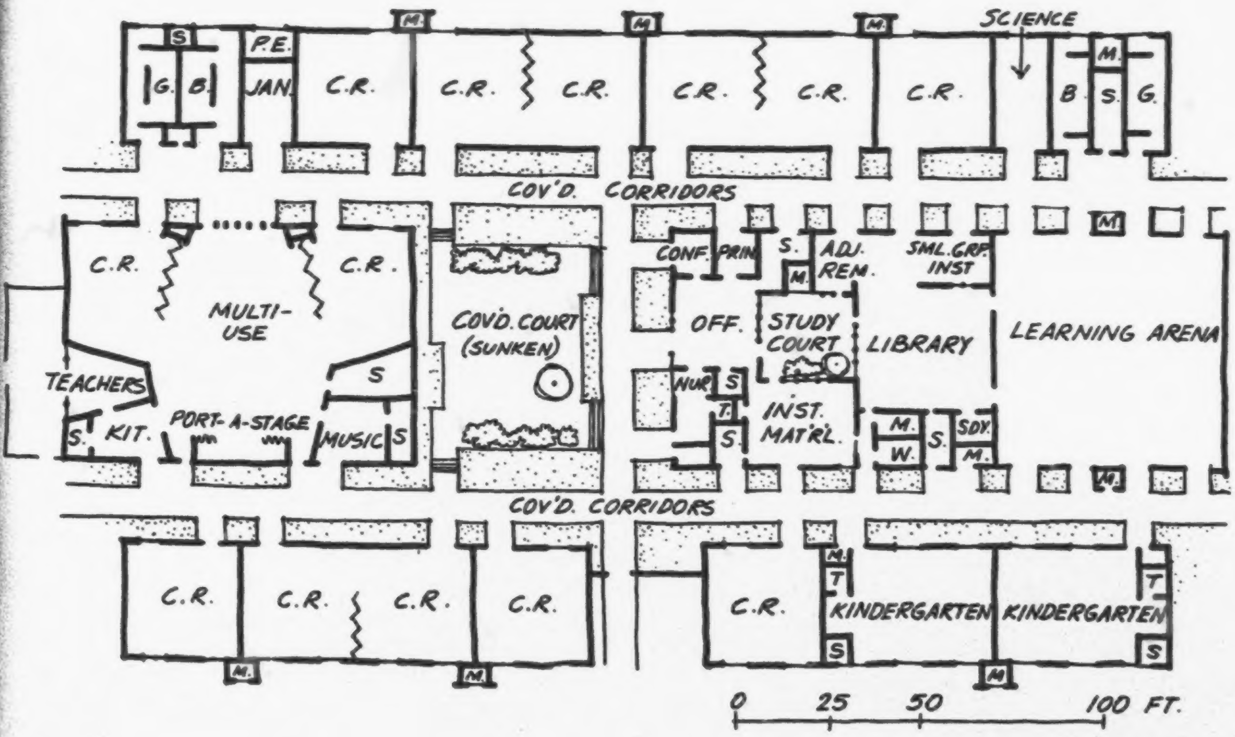
OPENED: *September, 1961*
ENROLLMENT: *110*
GRADE: *2*
ARCHITECTS: *Dalton & Dalton Associates*
SUPERINTENDENT: *Warren F. Thomas*
PRINCIPAL: *James Grand*
COST: *$13.20 per square foot*

The Sands School's Little Red Schoolhouse is open space in its simplest form: a 60- by 70-foot rectangle enclosing the equivalent of four average classrooms. Connected to the main building by a covered walkway, the addition is entered through a vestibule containing individual cubicles for children's coats and other belongings.

To one side of the vestibule, within the big room, is the teachers' workroom, with built-in desk units along one wall. Two small rooms, 6 by 14 feet, at the other end of the building were originally intended for storage but have since been pressed into service for small group instruction—one as a science lab, the other for remedial reading.

There are no other adjunct spaces, though visual separation can be provided by drawing a fabric curtain across the width of the room and re-arranging the movable furniture. Nor is there any extra space in the form of a central common. (In fact, with auxiliary spaces subtracted from the building's total 4,560 square foot area, the open instructional space comes down to about 52 by 58 feet, which is slightly less than four separate classrooms would provide.) Because of this, and because the floor is not carpeted, this prototype space is reportedly noisier than later examples. Another drawback is lack of display space: windows along the sides of the building and doors breaking the end walls put usable wall area at a premium.

Nevertheless, the absence of interior partitions has enabled an enthusiastic teacher team to develop a highly creative program within the open space. The entire K–3 school is nongraded, but since main building classrooms are self-contained, only the second-graders in the addition can be readily grouped by achievement in all subjects.



Nelson S. Dilworth Elementary School
San Jose, California
Cupertino Union School District

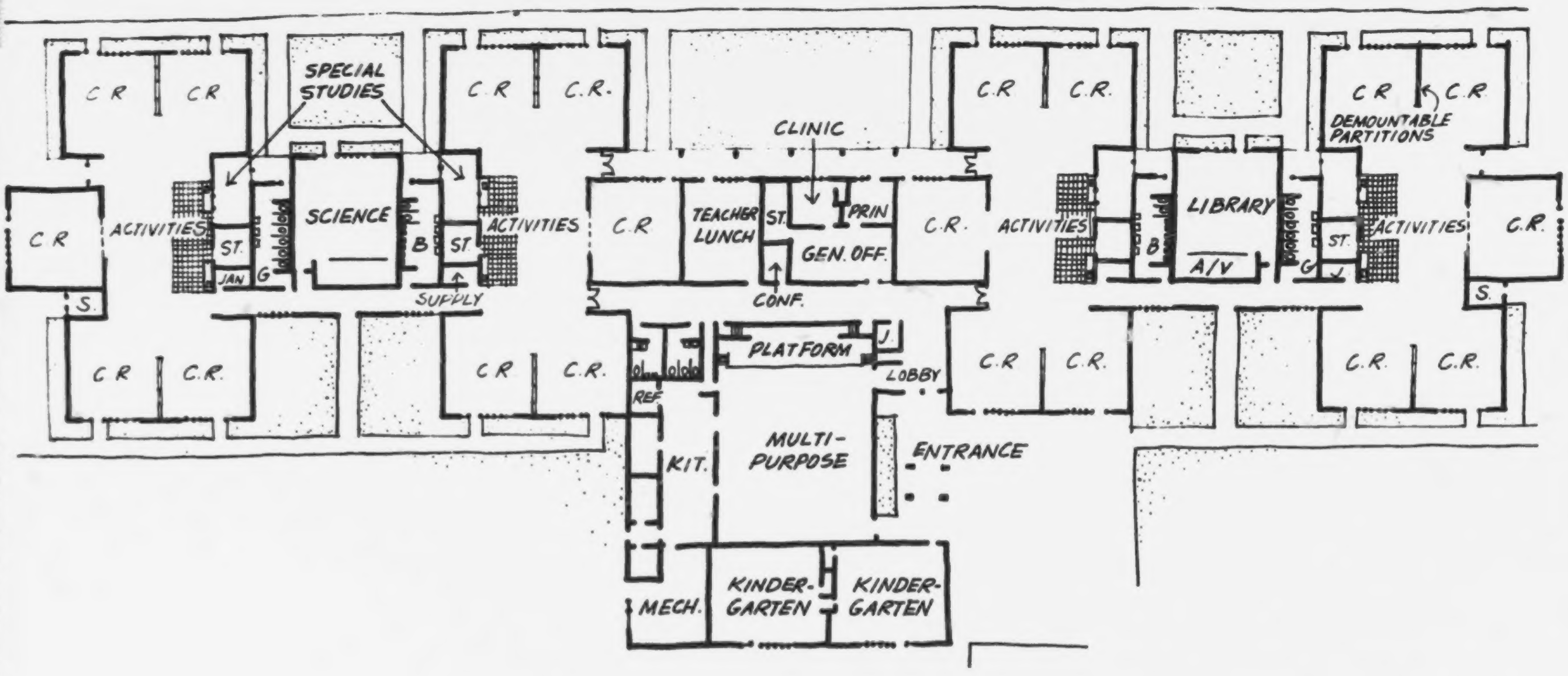
OPENED: *September, 1962*
CAPACITY: *710*
GRADES: *K–6*
ARCHITECTS: *Kal H. Porter & Associates*
SUPERINTENDENT: *Charles Knight*
PRINCIPAL: *Janet Goss*
COST: *$15.17 per square foot*

In its own district, as in the annals of open space, Dilworth is a transitional school—a link between the conventional schools of the past and the more flexible schools now being built to accommodate such instructional innovations as team teaching and nongrading. (At Dilworth and other district schools, grades 1 through 6 are being replaced by performance grouping on 17 levels of instruction.) Only four classrooms at Dilworth are open space; the rest of the building contains traditional classrooms.

The plant is made up of five separate buildings linked by covered outdoor corridors and a central sunken court that serves as a semi-enclosed activity area. Three of the units are classroom wings. Another is a multi-use wing which includes two classrooms. The fifth combines administrative offices, the library and adjacent special instructional spaces, and the learning arena known as the "big room," which fuses four classrooms into 3,840 square feet of unbroken space.

The open space does not include a central common, but teaching stations concentrated in the corners of the square leave enough space in the center for activities involving all the big room's occupants (now 110 students and 4 teachers). Since the floor is carpeted, noise has not been a problem except when the space has been over-populated.

There is no provision for subdividing the open area, and no adjunct space as such. Big-room groups make frequent use of the library and the spaces adjoining it: the large-group instructional materials area, a 15-student small-group room, and a two-student cubicle for independent study. A small (half the size of a standard classroom) room across the open corridor is used as a science lab. However, teachers would like to have a separate office for planning and preparation, which is now done in the library or teachers' lounge, and a foyer where children's coats could be stowed away. (They now use coat racks which must be brought inside in bad weather, thus cutting down on the big room's space.) They also complain that the doors to the library are placed so that general traffic must cross through one of two teaching stations.


SPECIAL STUDIES
C.R
C.R
C.R
C.R.
CLINIC
C.R
C.R.
C.R
C.R
DEMOUNTABLE PARTITIONS
C.R
ACTIVITIES
ST.
JAN
G
SCIENCE
B
ST
ACTIVITIES
C.R
TEACHER LUNCH
ST.
PRIN
GEN. OFF.
C.R.
ACTIVITIES
B
LIBRARY
A/V
G
ST.
ACTIVITIES
C.R.
S.
SUPPLY
CONF.
S.
C.R
C.R.
C.R
C.R.
PLATFORM
LOBBY
C.R.
C.R.
C.R.
C.R.
REF
KIT.
MULTI-PURPOSE
ENTRANCE
MECH.
KINDER-GARTEN
KINDER-GARTEN

Fairmont Elementary School
Pacifica, California
Laguna Salada Union School District

OPENED: *September, 1964*
CAPACITY: *880 (Current enrollment: 720)*
GRADES: *K–8*
ARCHITECTS: *Masten & Hurd*
SUPERINTENDENT: *Frederick E. Lucas*
PRINCIPAL: *Miriam Swett*
COST: *$13.83 per square foot*

Fairmont is a step up in sophistication from Dilworth in that the entire school, except for the kindergarten, is open plan. The school consists of four repeated open classroom clusters (called "wings") connected to each other by facilities that serve all the clusters. In the center of the school is a fifth unit which includes administrative offices, a multipurpose room used as an auditorium-gymnasium, and the two kindergarten rooms. The two wings on one side of this central unit are joined by a science room; those on the other side, by the library.

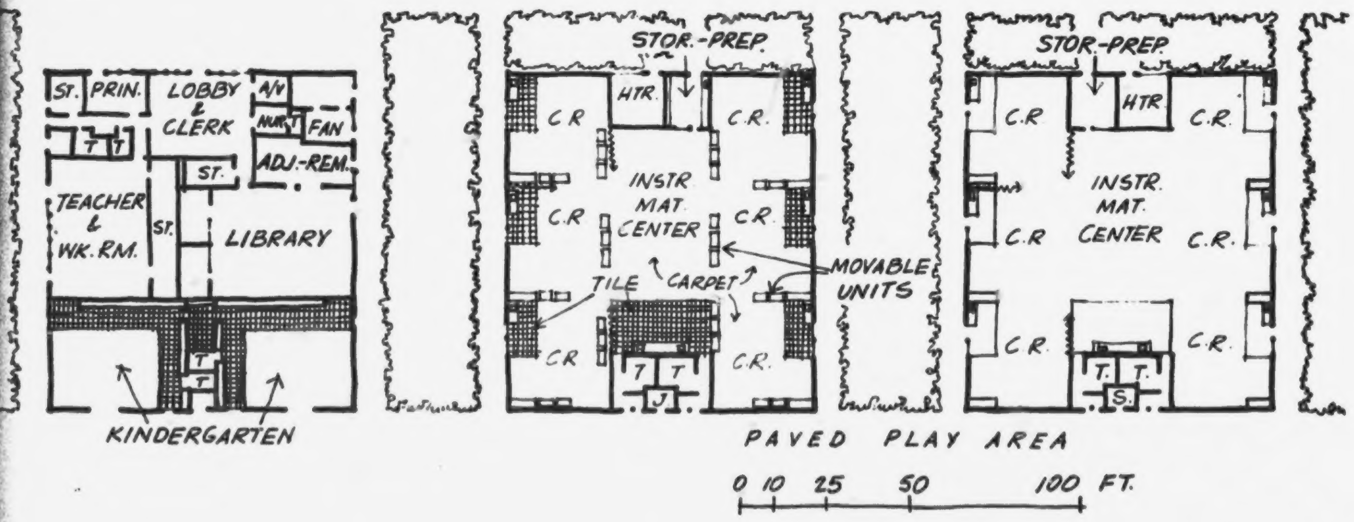
The classroom wings themselves differ from Dilworth's big room in several respects:

1) Each wing has more space than five regular classrooms. Instead of wresting common space from the teaching stations, there is a central activities area of 1,440 square feet. The nominal size of each teaching station is 883.5 square feet, but each class can use 995.5 square feet without disturbing 800 square feet in the center. Total gross area of each wing is 6,595 square feet.

2) One of the five classrooms in each wing is set apart from the others in an alcove off the common area. This was done to give teachers who prefer it more privacy, but in two cases, teachers who originally chose the separate classroom have since voluntarily moved out into the open space.

3) Each wing has two panel-type operable walls set up to provide a partial visual barrier between pairs of teaching stations. The walls are only 16 feet long, but since the ceiling track extends the full 28-foot width of the classrooms, additional panels can be added if more complete separation is wanted in the future. This year, the walls in the first-second and sixth-seventh grade wings are extended to only half their length—that is, 8 feet. In the third-fourth-fifth grade wing, the teachers asked that the walls be removed altogether. In the seventh-eighth grade wing, both partitions are fully extended, but on one side of the unit, the partition has been pulled from the exterior wall over to the activities end of the adjoining classrooms.

4) In addition to the special purpose areas (library and science room) shared by all the wings, each wing at Fairmont has its own instructional materials storage room and a special studies room which doubles as a teacher work room.



William Faria Elementary School
Cupertino, California
Cupertino Union School District

OPENED: *February, 1965*
CAPACITY: *475 (Current enrollment: 325)*
GRADES: *K–6 (nongraded)*
ARCHITECT: *Edwin J. Meyers*
SUPERINTENDENT: *Charles Knight*
PRINCIPAL: *Mary Hedges*
COST: *$14.86 per square foot*

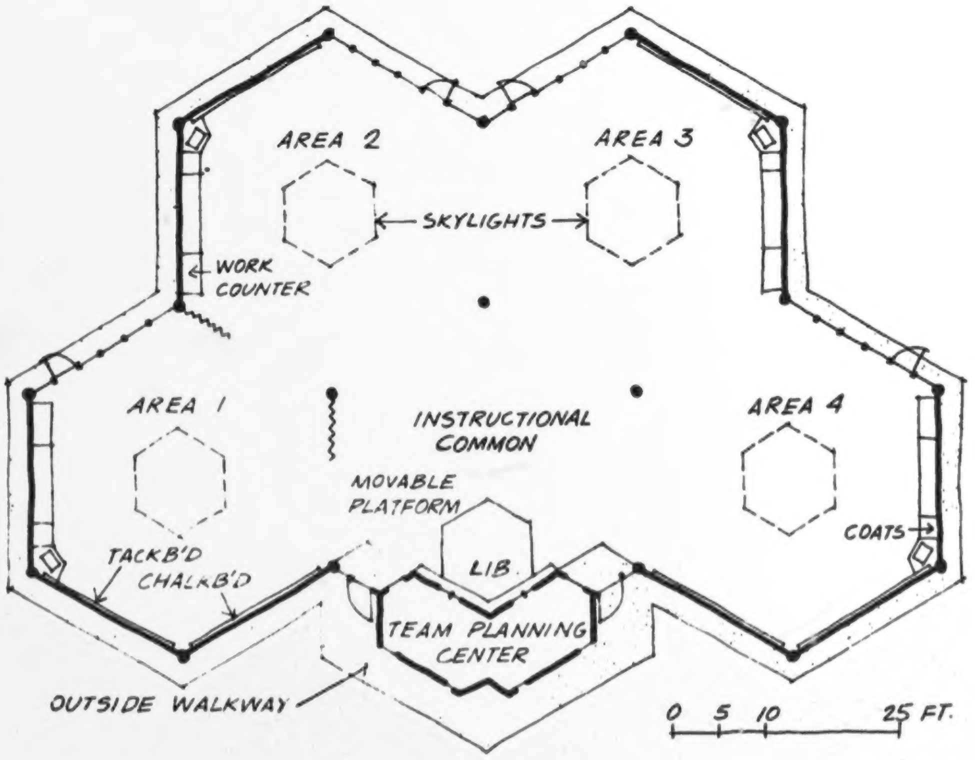
The Faria School, with its identical twin, the DeVargas School, attests to Cupertino's satisfaction with the results of its venture into open space at Dilworth. Here, the big-room experience is extended to the entire population of the school, again excepting the kindergarten.

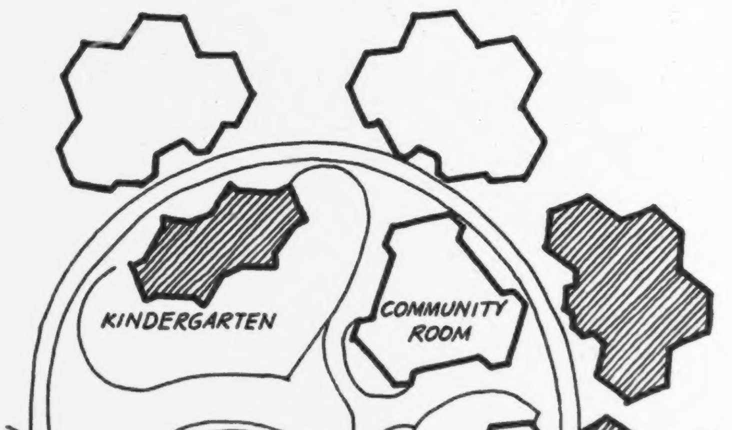
The school is composed of three separate buildings, each measuring 90 by 96 feet. One is an administrative unit that also contains the library, teachers' lounge, storage areas, and two large kindergarten rooms. The other two are open teaching spaces enclosing the equivalent of six classrooms, plus a common. (A third teaching unit will be added when needed. At present, the school is underenrolled, each unit housing only five classes instead of the planned-for six.)

The primary grades, first to third, occupy one big room; the intermediate grades, fourth to sixth, occupy the other. However, since formal grades are replaced by 17-level performance grouping, as at Dilworth, teachers feel that the complete separation of the buildings, which are not connected by so much as a covered walkway, is incompatible with the non-separation of the groups inside them. Teachers would also prefer the administrative unit to be centrally located so the library would be more readily accessible.

Within each big-room unit, 30- by 32-foot teaching stations are lined up on both sides of a central common which serves as an instructional materials center and large-group space. At one end of the common, a 15- by 30-foot tiled area surrounds two sinks used primarily for science work. Tile also replaces carpet in an 8- by 16-foot area around the sinks at the entry to each teaching station.

Though there are no adjunct spaces except a storage-preparation room off the common, operable walls make it possible to partition off areas for small group instruction or special activities. The teaching station at upper left on the plan can be wholly enclosed; the station at lower left can be walled off on the side next to the common; or the operable walls can be drawn along the full length of the building, enclosing one standard-size classroom and one double classroom. Ceiling tracks have also been provided on the other side of the room to receive similar walls if and when they are wanted.


AREA 2
AREA 3
SKYLIGHTS
WORK COUNTER
AREA 1
INSTRUCTIONAL COMMON
AREA 4
MOVABLE PLATFORM
COATS
TACKB'D
CHALKB'D
LIB.
TEAM PLANNING CENTER
OUTSIDE WALKWAY
0 5 10 25 FT.


KINDERGARTEN
COMMUNITY ROOM
UTILITY
LIBRARY, ADMINISTRATION TEACHER EDUC. CENTER*
* UNSHADED BUILDINGS TO BE COMPLETED IN 1965

*Granada Community School

Belvedere-Tiburon, California
Reed Union School District

OPENED: *November, 1964*
PLANNED CAPACITY: *600*
PRESENT CAPACITY: *300*
GRADES: *K–6 (nongraded)*
ARCHITECTS: *Callister & Rosse*
SUPERINTENDENT: *Edward C. Pino*
PRINCIPAL: *Paul Coste*
COST: *$14.09 per square foot*

As in the case of the Faria School, Granada's open space is in the form of independent buildings. Of the three existing units, one houses the kindergarten and administrative suite. The other two are open classroom clusters housing nongraded "families" of 6- to 8-year olds (the Alpha family) and 9- to 11-year olds (the Beta family).

As the site plan shows, by September 1965, three more buildings will be added to the present group. The most unusual of these will be a teacher-education center administered by the district in cooperation with a nearby university. It will contain an instructional materials center, a professional research library, carrels and office space, adult seminar classrooms, and a closed circuit television studio. The second new building will be a multipurpose community room. The third, Gamma House, will duplicate the existing classroom clusters, except for minor modifications. (A fourth cluster is slated for 1966.)

To prevent the buildings' locking the district into a fixed educational pattern, classroom clusters are designed on a 960-square-foot module, the minimum area required for a classroom in California. Each of the four hexagonal teaching stations ranged around a cluster's central common (848 square feet; also hexagonal) has its own entrance, sink, and other fixed equipment, plus tracks in the ceiling beams to receive partitions. If a future administration wants to convert to self-containment, walls can be installed easily and at little expense. Or, if the teachers in a cluster decide they want a separate, totally enclosed room, they can have it. (Some walls have already been bought and stored for this eventuality.) To date, however, teachers have indicated no desire for separate areas within the clusters, perhaps because the acoustics are good (the space is fully carpeted including areas around the sinks); the space is well equipped (see page 33); and the total teaching area is generous (4,923 square feet).

The only adjunct space in the clusters is the 235-square-foot team planning center, which is divided by a folding wall into two separate spaces: a curriculum lab where instructional materials and equipment are stored, and a teachers' office and work room.

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*Planned with assistance from EFL.

George Miner Elementary School
San Jose, California
Oak Grove School District

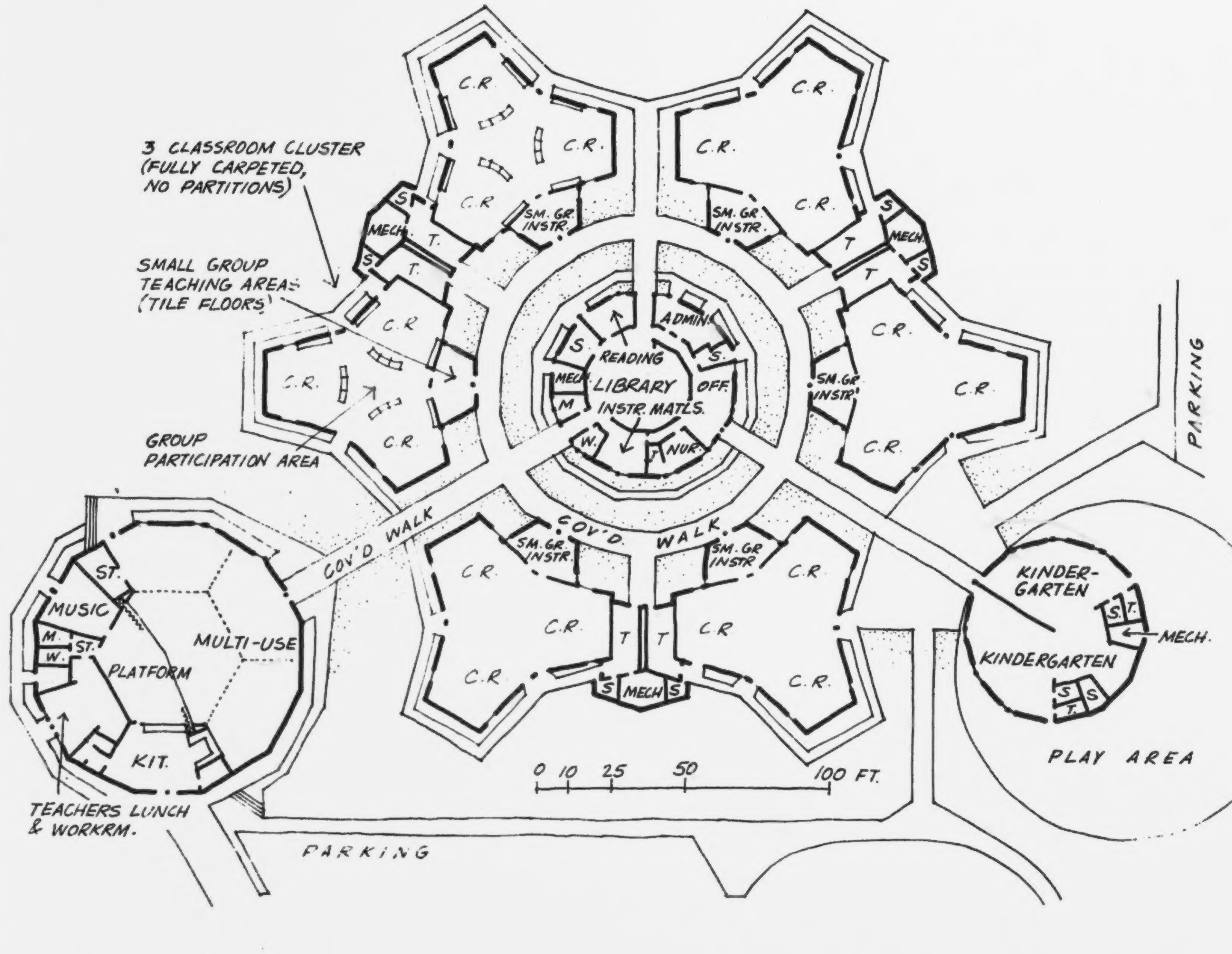
OPENED: *September, 1964*
CAPACITY: *704 (Current enrollment: 400)*
GRADES: *K–8*
ARCHITECTS: *Porter-Gogerty-Meston & Associates*
SUPERINTENDENT: *Leonard Herman*
PRINCIPAL: *Boyd Morningstar*
COST: *$15.17 per square foot*

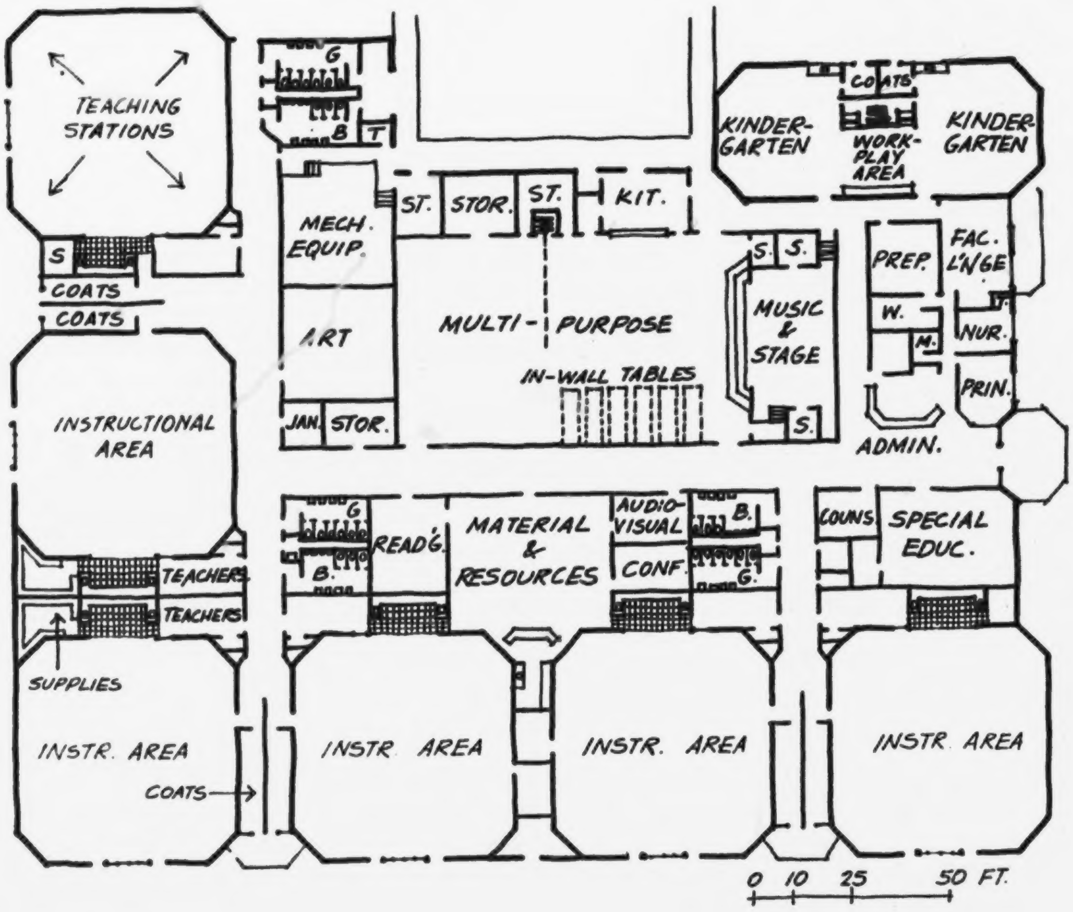
At the George Miner School, the open classroom clusters are "tri-pods" made up of three teaching stations shaped so that each has three walls for vertical work surface and display but each station opens to a common participation area in the center. Clusters are paired, with toilets, mechanical spaces and storage between, and linked via covered walkways to a central unit housing the administrative suite, library, instructional materials center, and remedial reading room.

The main entrance to each cluster is through a foyer which doubles as a teacher workroom and small-group room for art, science, and other special activities. The only uncarpeted space in the cluster, the foyer contains a sink and storage units, and can be divided down the middle by a curtain, forming two separate areas. However, teachers feel that this room should be larger so as to provide more adequate work, storage; and teaching space; and that the curtain, which is a visual barrier only, does not give enough separation when two groups are working in the room at the same time.

Moreover, the clusters themselves are small compared to the big-room units in other new open-plan schools. Each cluster contains 2,709 square feet, plus the 351-square-foot foyer cum small-group room. Classrooms are figured at 903 square feet including the extension into the group participation area. With this area, (nominally 535 square feet) subtracted from the total, they shrink to 725 square feet, though inclusion of the mechanical spaces between paired clusters, as well as the foyers, brings average classroom size above the requisite 960 square feet.

The two buildings that complete the Miner School complex are a multipurpose unit used for rainy-day physical education, lunch, assemblies, and the like; and the kindergarten. Unlike the self-contained kindergartens found in many otherwise open schools, Miner's two kindergarten rooms are partially open to one another, on the theory that children should be exposed from the beginning to the open teaching environment they will encounter in later grades.


3 CLASSROOM CLUSTER (FULLY CARPETED, NO PARTITIONS)
SMALL GROUP TEACHING AREAS (TILE FLOORS)
GROUP PARTICIPATION AREA
C.R.
SM. GR. INSTR.
S
T
MECH
ADMIN
READING
LIBRARY
INSTR. MATLS.
OFF.
MECH
M
W.
NUR.
COV'D WALK
ST.
MUSIC
M.
W.
PLATFORM
MULTI-USE
KIT.
TEACHERS LUNCH & WORKRM.
KINDER-GARTEN
KINDERGARTEN
MECH.
PLAY AREA
PARKING
PARKING
0 10 25 50 100 FT.


TEACHING STATIONS
S
COATS
COATS
INSTRUCTIONAL AREA
TEACHERS
TEACHERS
SUPPLIES
INSTR. AREA
COATS
G
B
T
MECH. EQUIP.
ART
JAN.
STOR.
ST.
STOR.
ST.
KIT.
MULTI-PURPOSE
IN-WALL TABLES
S.
S.
MUSIC & STAGE
S.
KINDER-GARTEN
COATS
WORK-PLAY AREA
KINDER-GARTEN
PREP.
FAC. L'NGE
W.
M.
NUR.
PRIN.
ADMIN.
G
B.
READ'G.
MATERIAL & RESOURCES
AUDIO-VISUAL
CONF.
B.
G.
COUNS.
SPECIAL EDUC.
INSTR. AREA
INSTR. AREA
INSTR. AREA
0
10
25
50 FT.

Philo Farnsworth Elementary School
Salt Lake City, Utah
Granite School District

TO OPEN: *September, 1966*
CAPACITY: *720*
GRADES: *K–6*
ARCHITECT: *M. E. Harris*
SUPERINTENDENT: *Elmer J. Hartvigsen*
COST: *Data not yet available*

In contrast to the sprawling California schools, the Farnsworth School, to be bid in July, will be a compact rectangle with open teaching spaces ranged along two outside walls. Common facilities—administrative offices, multipurpose room, arts and crafts room, and the like—will be concentrated in the remaining area.

The six big rooms are 58- by 58-foot squares with filed-off corners. At 3,200 square feet, each will be large enough to hold up to 110 to 120 students, but the district hopes to keep room populations down to three average classes—90 to 100 children—plus three or four teachers assisted by student teachers.

As at Dilworth, teaching stations will be located in the corners of the square, leaving the center of the room free for assembly and large group instruction. There is no extra space allowance for a central common area, but the need for additional space within the rooms is lessened by grouping them around special-purpose rooms to which noisy or untidy activities like music and art can be transferred when necessary.

Each big room will include a wetwork alcove with tiled floor and two sinks, to be used for art and science. (The rest of the instructional area is carpeted.) Immediately adjacent to the alcove is the teachers' office, with desks, files, and storage. A smaller room on the other side of the alcove in four of the big rooms (first through fourth grades) is used for storing instructional materials. Storage rooms for the oldest grades are in between the two big rooms (bottom of plan), and these fifth- and sixth-graders have direct access to the material and resource center (library).

Two television sets and a movie screen are planned for each big room. In addition to using the local educational TV channel, equipment will enable the teachers to originate TV in any of the big rooms and send it to any or all of the other rooms.

As at Miner, the kindergarten area gives children an early introduction to open space by joining the two rooms, for 30 students each, with a common play area.

***Valley Winds Elementary School**
St. Louis County, Missouri
School District of Riverview Gardens

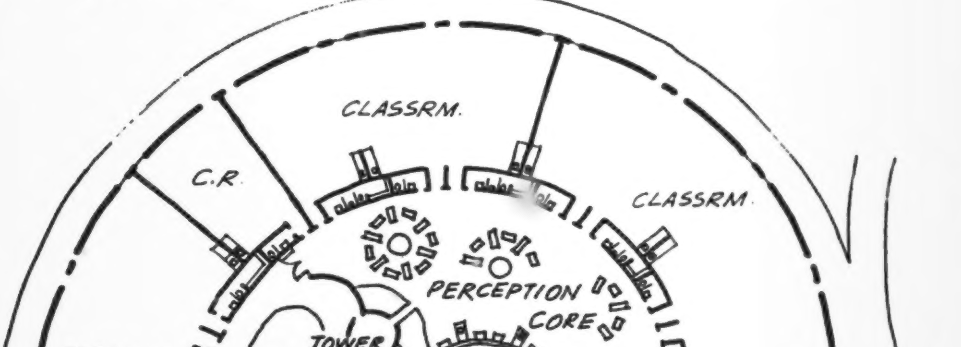
OPENED: *December, 1964*
CAPACITY: *660 (Current enrollment: 548)*
GRADES: *K–6 (nongraded)*
ARCHITECTS: *Shaver and Company*
ASSOCIATE ARCHITECTS: *Manske & Dieckmann*
SUPERINTENDENT: *Nolan Estes*
PRINCIPAL: *Charles Mansfield*
COST: *$13.69 per square foot*

In the caracole-shaped Valley Winds School, the classroom cluster becomes a continuous band of open space that spirals snail-shell fashion around a central core containing administrative offices, an arena theater, and a library-science-independent study area known as a "perception core." A teachers' planning area occupies the mezzanine level of a tower-like structure at the innermost point of the spiral.

From this glass-walled retreat, which contains desk and office space for each member of the teaching staff, teachers can keep an eye on children working in the 4,000-square-foot library below while going ahead with their own pursuits. Beneath the 1,860-square-foot work area is a production center where teachers—and, often, students—prepare audiovisual aids ranging from simple slides to videotapes, and an electronic "nerve center" where audiovisual resources are housed and disseminated to classrooms and library.

In lieu of the usual six grades plus kindergarten, children are grouped in three major teaching divisions: basic skills (ages 5 to 7), transition (ages 7 to 9), and independent study (ages 9 to 12). In addition to the kindergarten, which occupies two of the school's 20 wedge-shaped, 900-square-foot classroom modules, the basic skills division includes a four-module 3,600-square-foot open classroom suite, and one self-contained classroom for special instruction with small groups. The transition division is housed in a three-module suite (2,700 square feet), again with one enclosed module for small groups. In the independent study division (9 modules; 8,100 square feet), there are no small group spaces as such. Individuals and groups of various sizes work in classrooms or the library, moving freely from one to the other.

Preliminary plans called for operable walls which would make it possible to enclose single classrooms in the lowest grades and pairs of classrooms in the upper grades. But the operable walls were abandoned—and no attempt was made to hedge by installing ceiling track to receive partitions at some future date. In the school as constructed, the original classroom wedges, each 36 feet long, 25 feet wide at the outer wall, and 9 feet wide at the inner wall, are defined only by the location of sinks, toilet rooms, and doors. If visual separation is needed, it is provided by movable storage cabinets or other furnishings.



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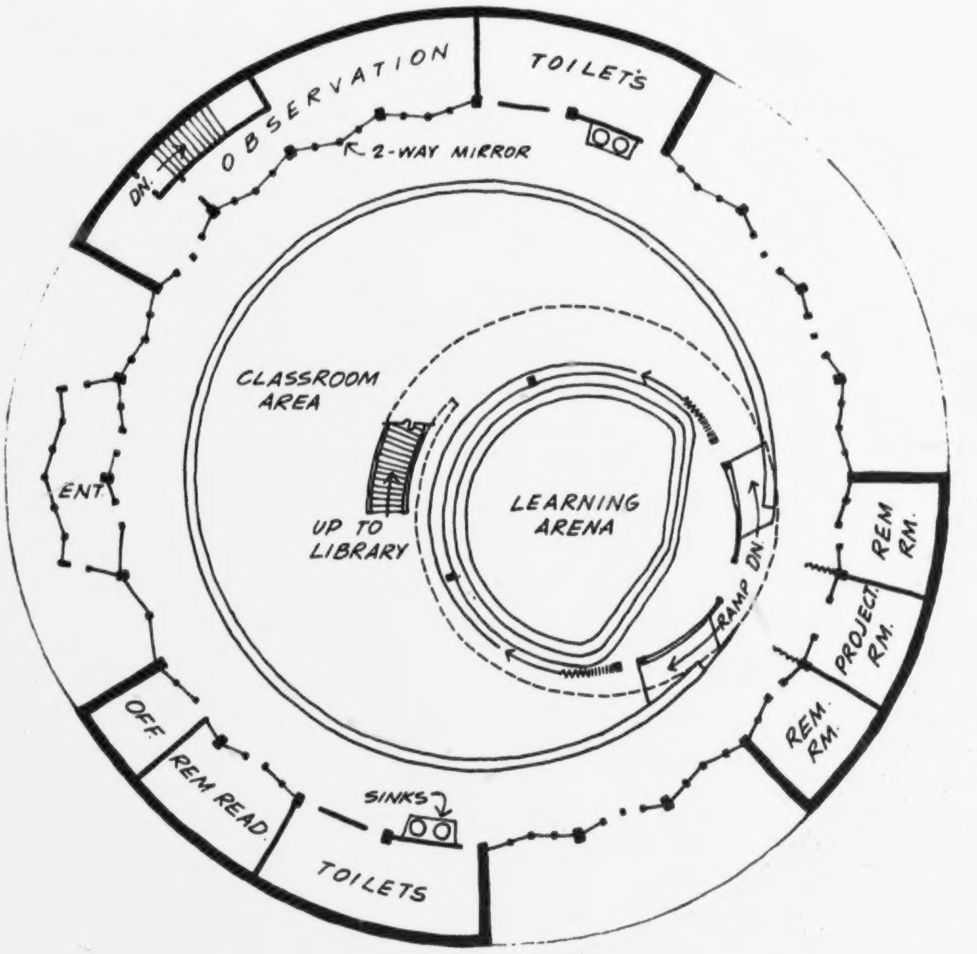
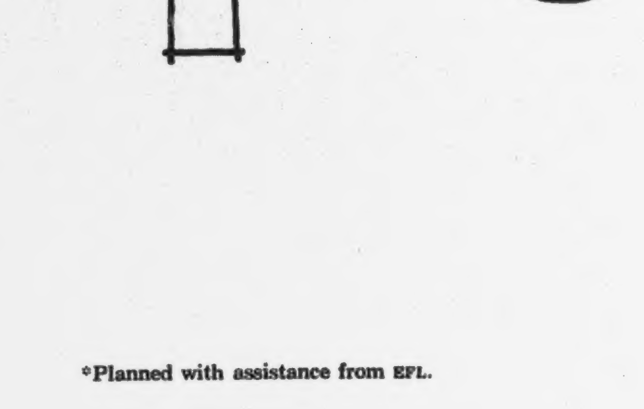
*Planned with assistance from EFL through its Southeastern Regional Center at the University of Tennessee, Knoxville, Tennessee.





***Public School 219, Satellite Building**
Borough of Queens, New York, New York
Board of Education of the City of New York

TO OPEN: *September, 1965*
CAPACITY: *150*
GRADES: *K–2 (nongraded)*
ARCHITECTS: *Caudill, Rowlett & Scott*
SUPERINTENDENT: *Calvin Gross*
PRINCIPAL: *Reba Mayer*
COST: *Data not yet available*

Though domes have been used for such educational facilities as gymnasiums and auditoriums, this open primary unit at P.S. 219 is believed to be the first academic building to take advantage of the dome's talent for enclosing large uninterrupted areas. An adaptation of a scheme developed in 1960 for Port Arthur, Texas, but abandoned when a local bond issue failed, the domed satellite building will provide a completely open setting for a nongraded K–2 program. It is being built in conjunction with an elementary-intermediate school housing grades 3 to 8. An existing school on the site is being renovated to house a second primary group.

The 7,850-square-foot circular area within the dome is surrounded by a glass wall pleated to break up sound. (Because of the uniformly curved roof, noise would otherwise focus in the center of the room.) To prevent wasting the space under the high ceiling at the center of the dome, the open teaching area is divided into several levels. A 9-foot-wide, concrete-floored outer ring, where the sinks are located, will be used for wetwork and other untidy activities. One step down is the main teaching area, which is punctuated by a sunken learning arena set off-center in the space.

Designed to accommodate large groups and noisy activities, the learning arena has a partial wall on one side, with a built-in, 6-foot-wide, rear-projection screen. The arena can be completely enclosed by drawing a simple fabric curtain for visual separation, or an accordion-type folding partition for acoustic separation. The floor of the learning arena is vinyl tile, but the three steps leading down to it are carpeted (as is the main classroom area) and wide enough for children to sit on.

Over this sunken assembly space, 11 feet above the main classroom level, is a mezzanine enclosed by a 4-foot high wood railing. This open, carpeted area (1,702 square feet), which houses the library for the primary unit, will be used for small-group instruction and independent study.

The only walled teaching spaces in the building are three separate small-group rooms in the enclosed areas which project beyond the undulating wall at the outer fringe of the dome. Other spaces in these enclosed areas are the teachers' office, toilets, an observation room with one-way mirror, and a projection room for rear-screen television and film projection into the assembly area.

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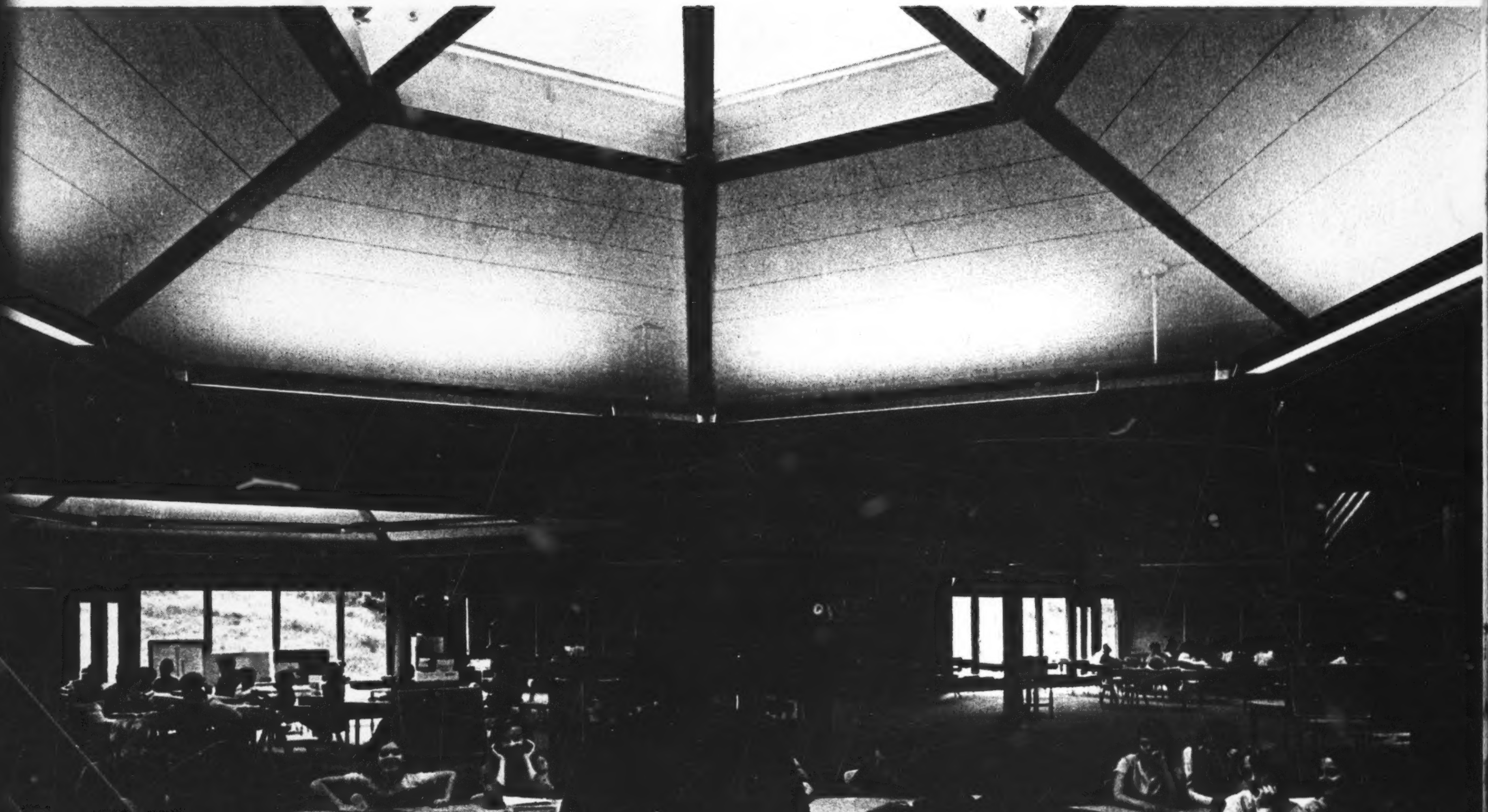
*Planned with assistance from EFL.

MAKING OPEN SPACE WORK

Open space is a still-experimental, still-evolving, and so far successful approach to schoolhousing for the elementary grades. It is also a simple one. But the concept is not so simple that its successful execution is automatic. Knocking down walls is not enough.

When a one-teacher, 25-student cell multiplies, the product is not just a bigger cell. The new space does not look or feel like a conventional classroom. It elicits different responses from the teachers and students who spend their days there. And it calls for different ways of accommodating the people, things, and activities that make up the total learning environment.

The following sections discuss some of the factors to be considered in planning schools without walls, and how—and how effectively—these considerations have been interpreted in the design of individual schools.



acoustics

The first thing schoolmen ask about when introduced to open space is noise. In general, open-plan schools seem to work well acoustically. First, people in an open classroom expect a certain amount of background noise and activity, and they adjust to it. As long as this noise stays in the background, they are able to go about their own pursuits undisturbed. Second, the very sounds they themselves make produce a background hum which helps to mask potentially distracting sounds.

If anything, some open classrooms suffer more from being too quiet than from being too noisy. This problem, called "acoustic deadness," is familiar to anyone who has ever attended an outdoor lecture. It means having to sit up close to the lecturer to hear him because his voice doesn't carry. Instead of bouncing off of hard surfaces—walls, floor, and ceiling—as sound would indoors, his voice is soaked up by grass and air before it gets past the first few rows of listeners.

The principal sound-conditioning material provided in open-plan schools is carpet, which is especially effective in classrooms because it eliminates a great deal of disruptive noise—books being dropped, chairs being pushed around, feet scraping, and so forth—at its source: the floor. But the planners of some open-plan schools, so worried about noise, have overdone it. On the theory that a lot of protection is better than a little, they have not only carpeted the floors but also upholstered the ceilings with acoustic tile. And, of course, there are fewer walls to reflect sound. As a result, the space works acoustically like an outdoor classroom where the lecturer must raise his voice if it is to carry any distance.

Dilworth, where there is both carpet on the floor and acoustic tile on the ceiling, illustrates this. Teachers complain that when children in their home stations sit beyond 19 feet from them, those in the back must strain to hear. Usually there is no need to seat children beyond that distance, but it did become necessary for a short time when a fifth class was temporarily added to the big room, raising the number of its occupants from the usual 114 to over 140. Under these circumstances, the burden of straining to hear the teacher was compounded by voice interference from neighboring groups. Since Dilworth has no space added to its central common and is simply the equivalent of four combined classrooms, children sitting farther than 19 or 20 feet from their teacher were closer to the back of another group than to the front of their own. With little space between groups to act as a barrier, the voices of youngsters reciting in peripheral classes could be heard more clearly than the voice of their own teacher.

The Fairmont School experienced a somewhat similar situation even though the ceilings are acoustically reflective. At one point, increased enrollment expanded the home station groups to some 35 in number rather than the planned-for 25. Stations there are smaller than the usual 960 square feet since 124.5 square feet were subtracted from each, to be added onto an enlarged central common. The staff was unconcerned about being able to accommodate the additional children since they thought the enlarged group could simply fan out into the common. But again, when they did, the children in the back had to strain to hear.

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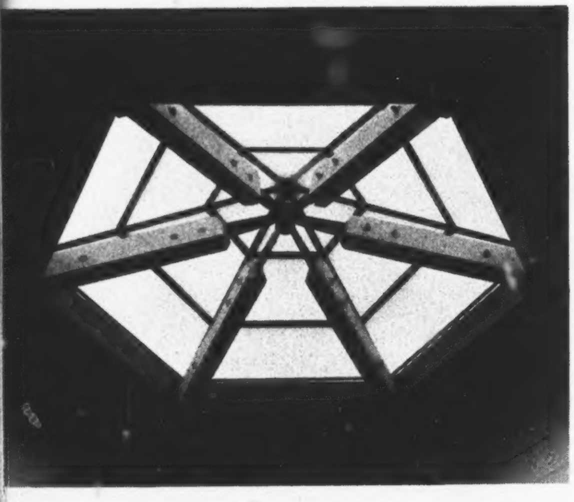
The answer, then, is that without nearby walls to reflect sound, children must be seated in close clusters within their groups for optimal hearing. This is especially true when the ceiling as well as the floor is acoustically absorptive. And there must be enough space between groups so that the space itself can act as a sound barrier. It is worth noting that at both Dilworth and Fairmont acoustic difficulties showed up only when the spaces were overpopulated.



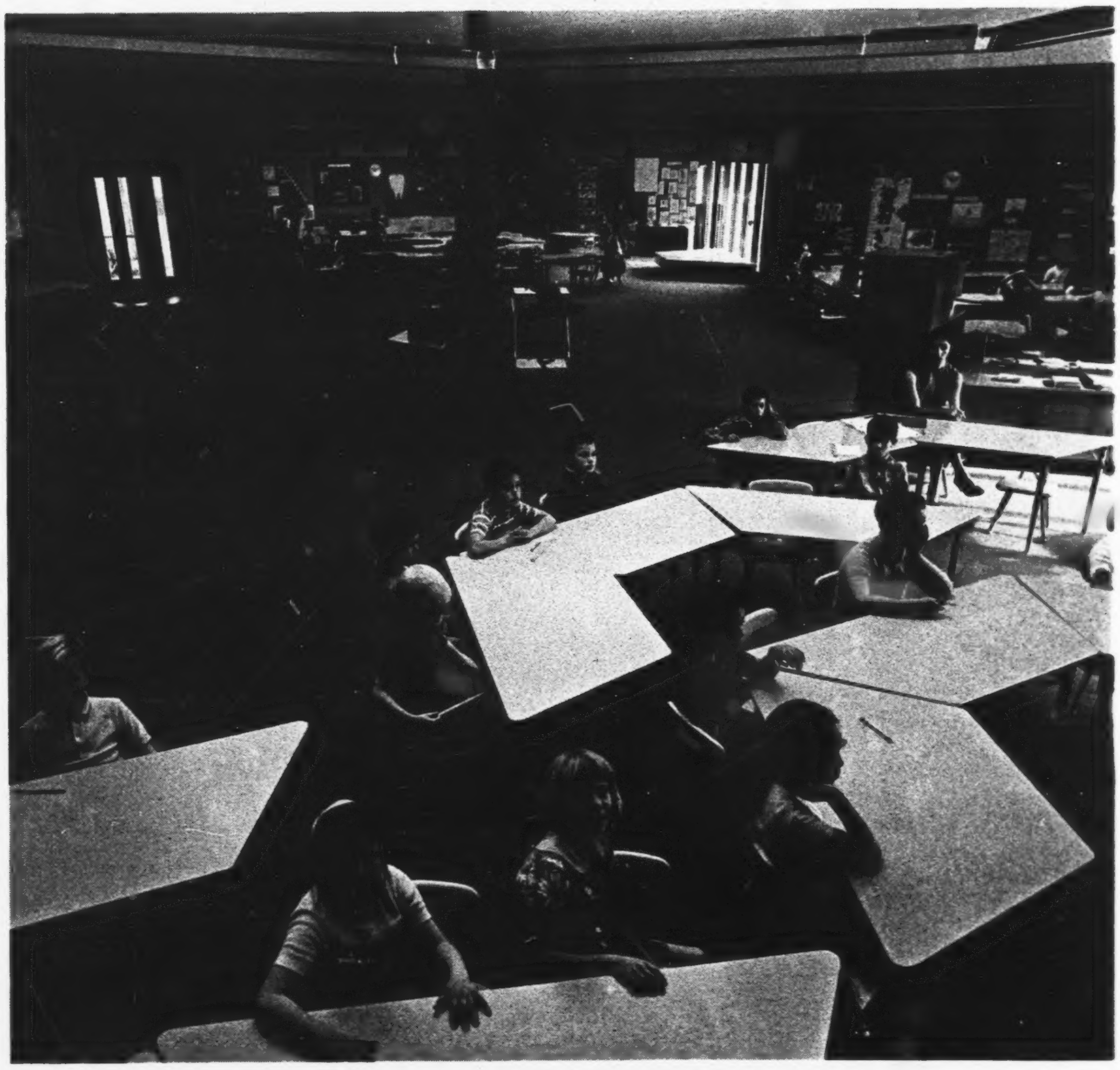
The Granada School presents a different kind of example because it involves another acoustic element: the ceiling configuration. There, too, much of the ceiling area as well as the floor is acoustically absorptive. But domelike roofs over each teaching station and over the central common tend, to some extent, to localize or contain sounds that originate with them.

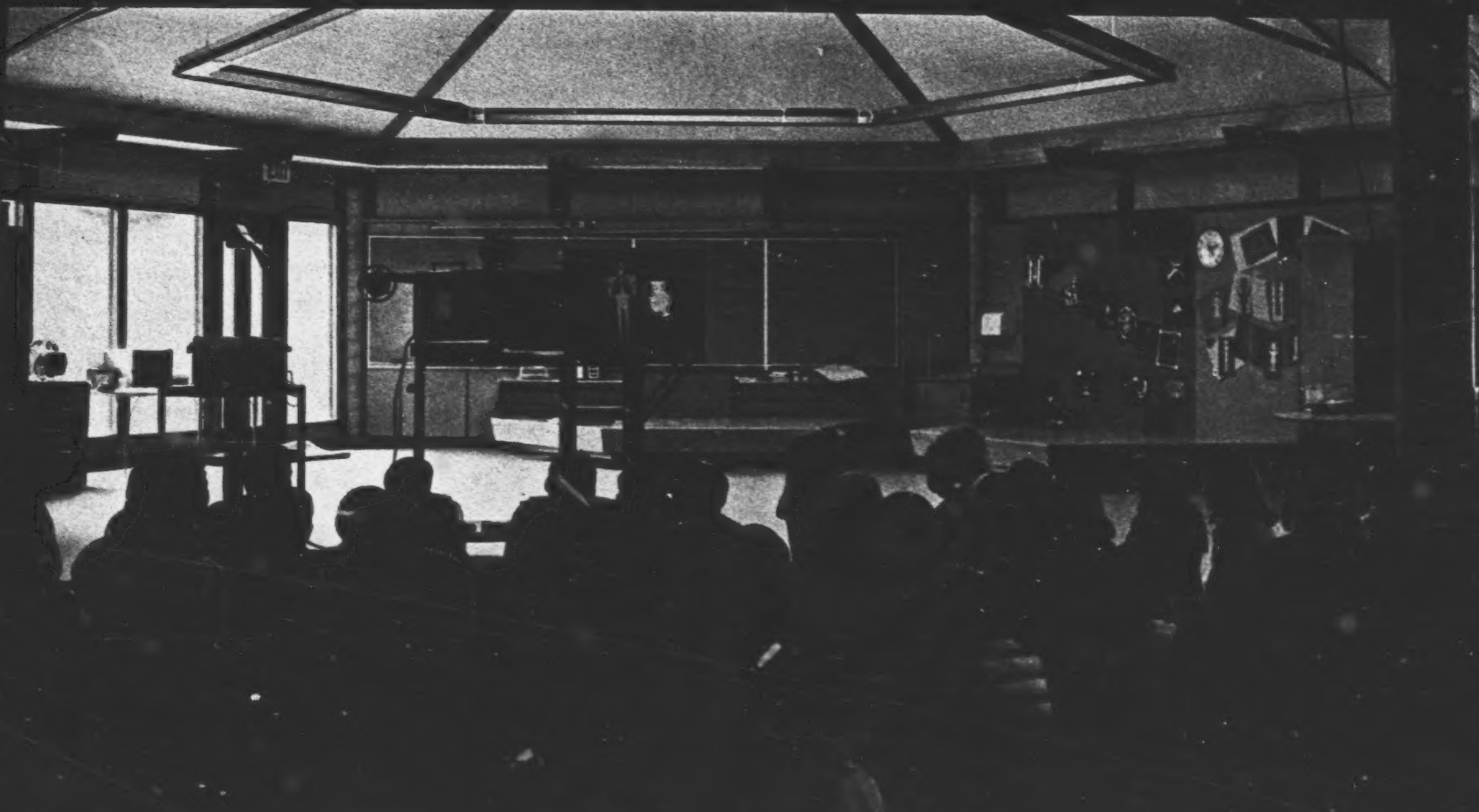
Some schools have employed variations in the height of their flat ceilings, making them lower in the teaching stations than in the central common. At Fairmont, for example, teaching stations have 9-foot ceilings, whereas the central common has a 10-foot-high ceiling. At the Faria and DeVargas Schools, ceilings are 10 feet high in the teaching stations and jump to 13 feet in the common. The theory is that the lower ceiling heights help to contain sound within the station and keep it from penetrating into other parts of the big room. But by and large the results of such variation are negligible.

In brief, here are two basic acoustical do's and don'ts for planning open schools:

1. Of the two horizontal surfaces in the room, floor and ceiling, treat only one acoustically—the floor. Treatment of both may have a deadening effect on the space. An acoustically absorptive (i.e., carpeted) floor stops unwanted sound where it starts; a hard ceiling reflects wanted sounds to where they are wanted.

2. Make the total dimensions of the room large enough so there can be adequate separation between work groups—and make sure the population of the room does not exceed the number of noisemakers it was planned for.





use of audiovisual equipment

There is evidence to indicate that because of the way open schools are organized, each classroom can have a bigger and better supply of teaching equipment than is ordinarily possible, at no additional cost. The Granada School is a case in point. Each classroom cluster has its own 8 mm. rear-screen motion picture projector, tape recorder and phonograph with loudspeaking and headset attachments, a piano, overhead projector, film-strip projector, a large primary globe, a kiln, and so on. What makes this large inventory possible is that the equipment was issued on the basis of a 100-child module rather than the usual module of 25.

The Reed Union School District, of which Granada is a part, operates under the California state aid program. Under the rules of the program, the state allocates funds for equipment according to the total population of the school; the district decides how the money is to be spent. Ordinarily, for example, a piano would be bought for every other classroom. But at Granada, where each classroom is the equivalent of four conventional rooms, there would then be two pianos to a cluster—or two in one room. So Granada took the $595 it would otherwise have spent on the second piano and bought a kiln. In short, with 100 children sharing equipment in a cluster, the equipment can be more varied—and better—than if it had to be duplicated in every classroom or shared by every two classrooms.

Superintendent Edward Pino points out that there is no equipment in any of the clusters that was not acquired by application of the state-aid formula based on the 25-module unit: Granada simply bought in terms of classroom space and distributed in terms of classroom population. Nor have any funds been spent out of operating expenses. (Most superintendents, according to Dr. Pino, set aside an additional $5,000 to $10,000 out of the first year's operating funds to buy capital outlay equipment beyond that acquired when a school is first opened.) Moreover, Granada has set up a reserve fund for some future items — for example, television cameras — by setting aside monies that would have been spent for such items as teachers' desks.

Although open-plan schools tend to make more extensive use of audiovisual devices, use of the equipment is no more complicated than in an ordinary classroom, and in one respect may be simpler.

Most open rooms have their own allotment of audiovisual hardware which is kept in the room or in its own storage area. The machinery is therefore immediately available, in contrast to traditional schools, where it may have to be procured from a central source and reserved in advance. Moreover, because of the nature of big-room programs and the planning involved, many of the rooms themselves are geared for ready and frequent audiovisual use.

A feature of Dilworth's big room, for example, is a wireless listening system that permits the "broadcast" of lessons, quizzes, or musical programs to the four separate teaching areas or to the entire room. Each of the four areas is encircled by a wire loop strung near the ceiling or baseboard. Via a wireless headset, anyone within the loop can pick up the broadcast transmitted to that area. The broadcast itself emanates from a record or tape placed on a phonograph or tape recorder by the teacher.* At a teaching station where a social studies lesson is in progress, the teacher may ask some of the children to put on their headsets (which simply hang on the leg brace of the desk) for a special program, while other members of the group continue their work with her. If a child completes his assigned work rapidly, the teacher may permit him to go over to another teaching area where he can listen to music or a poetry reading that is being broadcast within the loop there.

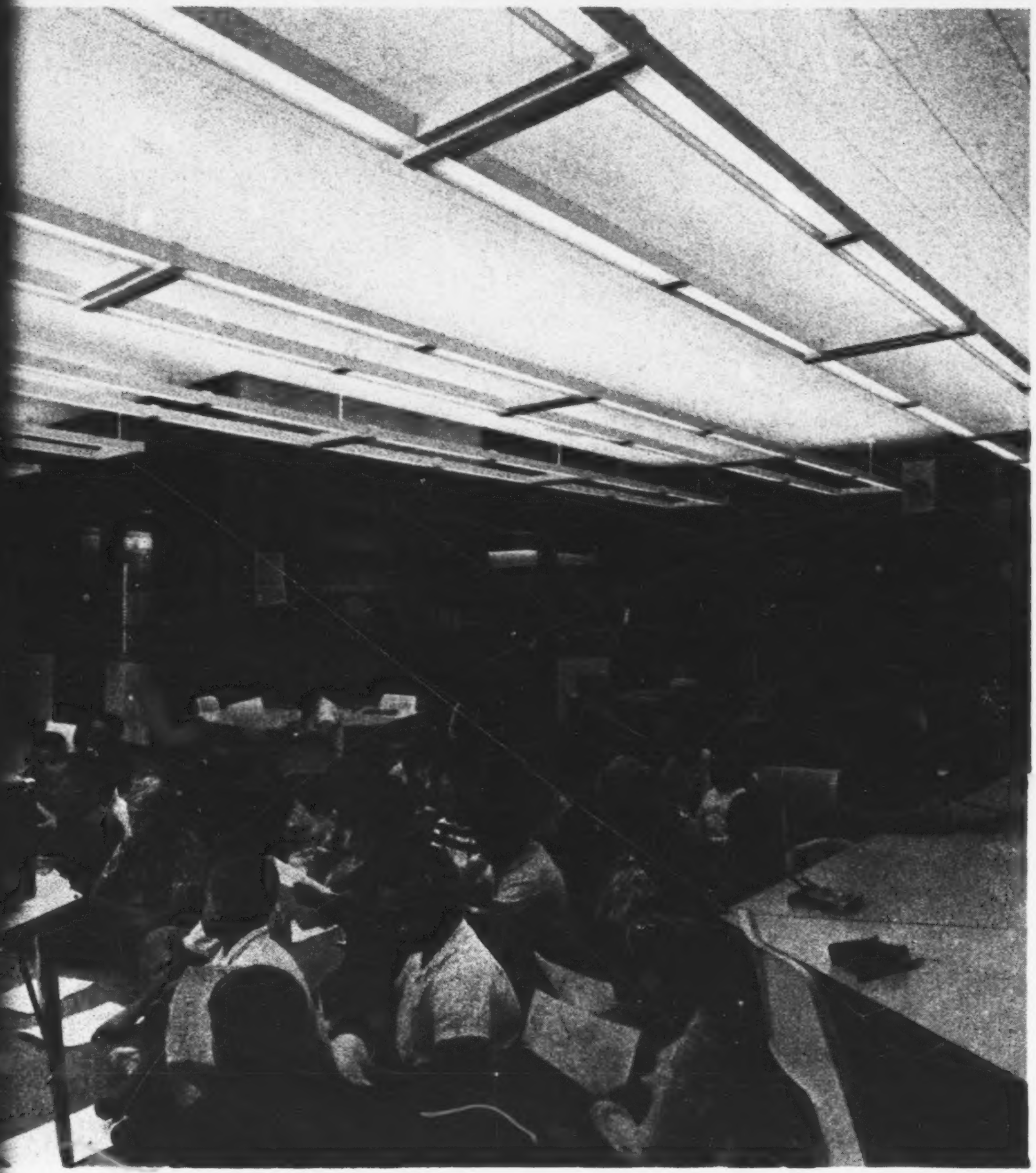
For those interested in the technical aspects, this system is not based on radio signals but on the principle of magnetic induction. To put it simply, it operates exactly like a telephone receiver except that no wires connect the receiver to the source of sound. Instead, the source of sound—the teacher's voice over a microphone, a tape recorder, a phonograph, a motion-picture sound track – is connected to an audio-amplifier which converts the sound into a powerful signal and feeds the signal to wire loops that circle the listening area. The signal creates a magnetic field in the area within the loop, and changes in the intensity of the magnetic field affect two permanent magnets in the pupils' headsets. The magnets, in turn, cause a metal diaphragm, similar to the diaphragm in a telephone receiver to vibrate, creating sound. The system, produced by Reflection Educational Products, Inc., of Mountain View, California, is substantially less expensive than similar ones that employ radio signals, though it has less fidelity. (For language teaching, high-fidelity equipment should be used.) Aside from the cost of installing the audio-amplifiers and loops at Dilworth, the cost of each headset was $14.85. In an ordinary classroom with 30 children and a teacher, cost for the entire system comes to just under $700.

The Granada School makes free use of tape recorders with plug-in headsets. Programed tapes are employed for remedial and accelerated work, and an effort is made to extend a child's interest in a subject by consolidating visual and audio activities. On the primary level, for example, an individual child may listen to a taped reading which accompanies his own reading of the same story. The taped voice may instruct him to "turn to page six and read with me," it may stop to define the meaning of a word, or it may pause to discuss a picture that appears on a page of text.

So much for headset listening. Obviously sound that is not commonly audible throughout a room presents no problems. As for those devices generally used for group audiences — motion pictures, television, or film strips where the sound or image is projected into the room — there are slight differences from school to school in the way they are used, but in general the pattern is similar.

If the entire population is to see a film, the joint scheduling obviates any difficulties. All the children simply gather in the center of the room or the common, sit on the floor, and look at a large screen.

If but one group is to see a film while others are engaged in dissimilar academic work, in those schools where the big room is big enough to allow adequate separation of the teaching stations, the showing is presented by a portable projection unit within the station, without disturbances to others or room darkening. At the Faria School (7,680 square feet per room), teachers point out that film or slides in a single station constitute no distraction, as "the others can't hear what the teacher or sound track is saying, they don't know what the slides or film is about, so they don't pay attention. Besides, they're busy with what's going on in their own station." And at the Granada School (roughly 5,000 square feet per room plus domelike ceilings), Superintendent Pino reports that at the beginning of the year, when children were still new to big-room life, there was a slight stir of curiosity among those outside a station where a film was



being shown, but that soon wore off.

However, in some schools this is not the case. At Dilworth and the George Miner School, for instance, where the rooms are less than 4,000 square feet, if only one group is to see a film it is shown in a nearby room—the library or multipurpose room. The element that drives the single group out of the big room is not the visual image, but the audio. Because sound-track volume is always somehow greater than that of the human voice, it becomes difficult for a teacher in an adjacent station to compete with the amplified mechanical voice. In those rooms where total over-all footage is greater, allowing more separation between teaching stations, this difficulty is not encountered.

An interesting case in point is Delta College. Delta is a two-year community college in Saginaw, Michigan, with 22 per cent of its total assignable space in the form of two large, open teaching concourses 28 feet wide by 265 feet long—roughly the length of a football field. The concourses are studded with 18 television monitors. They were intended as spaces where students could meet in different size groups in a team-teaching program that would lean heavily on televised lectures so that teachers could be freed for work with individual students. For a combination of reasons, after Delta's first year the team-teaching program faltered, and the space was rarely required for large groups. But being totally malleable, with no physical barriers to dictate how it should be occupied, it continued to be used for ordinary size clases. The concourses are made up of repetitive modular bays, each bay 14 feet by 28 feet. Two bays, an area 28 feet by 28 feet, can comfortably accommodate an ordinary class. Therefore, a concourse should be able to house nine classes simultaneously.

But Delta soon found that it was not feasible to count on this high degree of utilization unless the scheduling called for the same television lecture in all the bays. Different programs, or television in some bays with live teachers in others, created a listening bedlam. As one sophomore put it: "If there's a televised lecture

in the next bay in chemistry and you're doing Shakespeare with a live teacher, it's tough to hear straight. The television is always louder than the instructor's voice. Or if there are two different television lectures going next to each other and the instructor doesn't sit in, it turns into a duel between the two classes to see who can turn their set higher."

The comments of an English department instructor, asked how he felt about working in the concourse, were corroborative. "At best," he said, "down there I accomplish one third of what I can get done in a regular room. Students don't recall lectures or television programs because of distractions. The only time it works is when everybody in the concourse meets for the same television lecture; then there's no interference. But the television program lasts only 25 minutes and the remaining 25 minutes are devoted to a talk by the instructor. Students get involved listening to the comments of teachers and students in the adjoining bays. I have to remind them that they're going to be tested on what *I* have to say and they had better listen to *me* regardless of how spectacular my colleague is." He adds that he has on occasion stopped students from adjoining bays, questioned them, and found they are better able to answer questions about his lecture than that of their own teacher.

Delta found that the solution lay in either scheduling like subjects simultaneously or leaving empty pairs of bays between lecture spaces. The number of classes that could be held at a time was therefore reduced to six, cutting their space utilization by a third.

Most of the big rooms now being planned have the advantage of experience accumulated by the earlier schools, and their dimensions plus their shape make greater separation possible. But beyond this, most are being designed so that at least one station can be partitioned to create a private place within the big room. These partitioned areas can serve for the private viewing of film by a single group, if the team in a big room finds that it works better that way.

In none of the schools is darkening of the room for visuals a problem. All are equipped with separate banks of lighting fixtures so those in a single teaching station or the common can be dimmed independently. Of course in schools such as Granada, equipped with portable rear-screen projectors, there is no need for light-dimming.

scheduling to prevent distraction

For life to proceed with order and harmony in an open room, some degree of joint scheduling of activities is necessary. Since joint planning is in any case a characteristic of the team in open rooms, it is routine to schedule music, dancing, and art simultaneously. These may be planned as activities held in the central common in which the entire population is joined, or they may be held separately but simultaneously in the teaching stations. The layout of the particular room and the presence and nature of adjunct space by and large determine the pattern.

At the Fairmont School, art, music, and dance are a joint activity in the central common. At Granada, Dilworth, and Sands, the same is true for music and dance, but art classes are conducted in the separate stations. At George Miner, where they make no claim to a team-teaching system but have "associative teaching," music and art are, nevertheless, jointly scheduled in the common. And if a group wishes to work on its own at another time, it does so in the small-group foyer.

For the rehearsal of a skit or play, in those schools where a curtain can be drawn, as at the Lewis Sands School, or a room can be separated by an operable partition, as at the Faria and DeVargas Schools, this is sufficient. Otherwise the actors move to a multi-purpose or other nearby room.

Except for those subjects which involve much noise or movement or both, there is little need for special scheduling to avoid distraction. The traffic of individual children shifting and regrouping throughout the day is no problem.

Some faculties express the view that the need for coordination between groups is a disadvantage imposed by the big room; that the loss of flexibility of time, inherent in a schedule, means spontaneity is sometimes sacrificed. A group cannot pursue a spur-of-the-moment enthusiasm or enjoy the prolongation of a hot discussion, they say, because to do so would impinge on the preplanned activities of others. Upon reflection, however, they acknowledge that scheduling is essentially an element of team teaching whether in a big room or a series of rooms; that indeed, it may be easier to work out quick, off-the-cuff changes when team members are gathered in a single place where communication between them is informal and casual.

partitioned and adjunct spaces

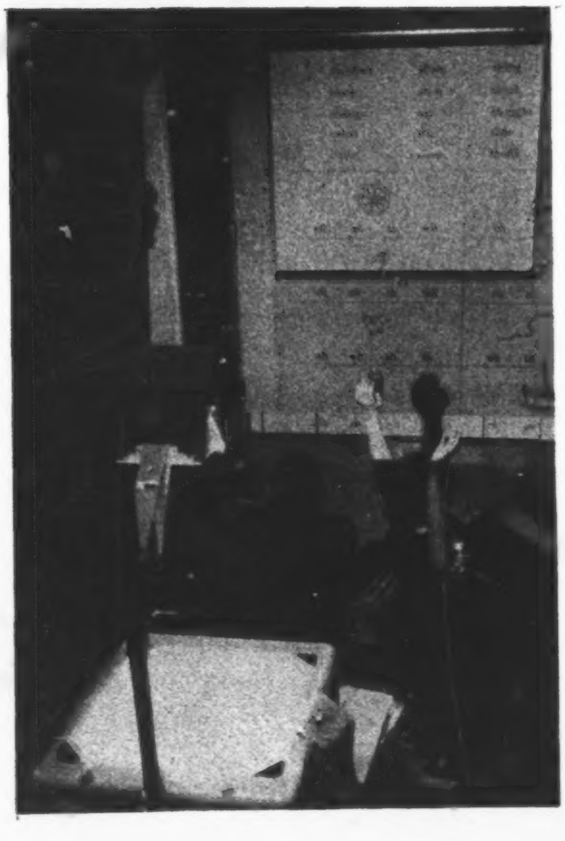
Open rooms being what they are, that is, large areas of *generalized* space, they require some adjunct spaces for *specialized* activities. To exclude such "special areas" imposes a rigidity no less undesirable than the rigidity imposed by rows of equal-size classroom boxes. There are times when small children, especially immature first-graders, do not respond to the movement and stimulation of a big room and need the calm of a separate place. Or there are times when it is the teacher who needs to get away with her group. Many second-generation open schools and virtually all of those on the drawing boards, in recognition of this, provide for the partitioning via operable walls of at least one teaching station within the big room.

At the Faria and DeVargas Schools, for example, there are 180 linear feet of accordion wall which can close off one teaching station of 1,000 square feet and, if desired, a second pair of teaching stations 2,000 square feet in area. At the Fairmont School, separation is provided not by dividing walls but by the room layout. The big room proper is rectangular in shape, but one of its five teaching stations is extruded, alcovelike, from the rectangle itself. Thus while there is no partition to separate the space, its placement in relation to other teaching stations accords it a relative degree of privacy.

Whatever the means, simple or sophisticated, the important point is that the option of separation be available. By providing that option, the flexibility of the big room is both extended and insured.

Just as it is important to have a separate medium-size room available, so is it important to have one or two separate small instructional rooms. There are occasions that call for intimacy between a teacher and student or a few students, just as there are certain kinds of instruction that are better handled outside a big room. Children with serious reading problems, for example, have the environment working for them if it is free of sound or movement so that nothing can detract from total concentration. Or, it is helpful to have a place where one child or a small group can carry on a sustained project, where a play can be rehearsed, where science experiments or constructions can be put together and left intact for a few days, without having to disassemble the materials.

The area involved need not be large.



It just needs to be there. The Sands School addition has two small adjoining rooms, each 6 feet wide by 14 feet long. One is used as a reading laboratory, equipped with overhead projector for magnification of words and letters, where quiet remedial work is done. The other, used as a science lab, contains microscopes, slide-making equipment, science books, and so forth. At the George Miner School, a foyer was designed to go with each big room: a 351-square-foot area equipped with sinks and countertops for clay and untidy artwork, for science, and for a variety of other purposes. At Dilworth, the library that adjoins the big room contains a small-group space 15 feet by 15 feet, plus two carrels for individual work. These are available for the big room's occupants, as is a nearby science room.

Teacher offices represent another space requirement, not absolutely essential perhaps, but highly desirable. With teachers expected to spend a high proportion of time planning together, preparing materials, meeting with parents, and so on, they too need a place. This is especially so in those big rooms where, as at Granada, teachers do not have desks. (Granada planned it that way, as a teacher's desk in her station might suggest that she had "a room of her own.") But aside from the question of an actual place for the staff to work, there are other persuasive considerations in favor of an office. One is the matter of rank. Inherent in the provision of an office is a recognition of the teacher's professionalism and a respect for the complexities of her job. A second consideration is the benefit that accrues from the free exchange of information encouraged by the informal, nonscheduled association of colleagues. One of the teachers at the Lewis Sands School observed, for instance, that "when we work side by side in the office, if one of us is grading spelling tests and notices that Joey Brown got a 30, it's sort of natural to mention it. You just spontaneously say 'What's happening to Joey? He got a 30 in this quiz. Have you noticed anything wrong?' No appointments have to be made between us, no formal discussions are necessary, we're just there together and naturally discuss whatever is happening."

Again, the space allotted need not be large. At the Sands School it is a narrow room with wall-attached work surfaces with bookshelves above them. At the Granada School it is an area of 235 square feet divisible by an accordion partition into two separate spaces. The office side provides one clerical station for the team, has more file space, counter and work space than desks for four teachers would offer, plus a telephone to the main administrative suite and the outside world. The staff finds the phone a great aid in maintaining close contact between themselves and their students' parents. The other side is a curriculum laboratory for the storage of instructional materials, duplicating machine, stencil typewriter, and so forth. In some places the special-studies room doubles as a teacher preparation room, as at the Fairmont School where a 234-square-foot space serves both purposes.

Storage space for instructional materials and equipment is especially important in open rooms because they tend to need more of everything than self-contained rooms—more duplicating paper, transparencies, programed texts, SRA kits, visual aids in math, and the like. Children and teachers are stimulated by seeing what other groups are doing and want to do them too, so that instead of a class of 30 making papier-mâché relief maps, 100 want to make them. But these are the things that keep the wheels in the big room turning and they should be easily accessible. In most schools the storage room for these materials (and often, the cluster's allotment of audio-visual equipment as well) is logically attached to or adjacent to the teachers' office. How much storage space is needed depends on the number of children housed in a building cluster. In the schools described here, allotments vary from 115 to 150 square feet, but in some of them even the higher figure is regarded as inadequate.

furniture, furnishings, and equipment

In addition to the usual furniture, some open-room schools have had special pieces of furniture designed to fit big-room uses. At the Granada School there are two unusual items. One is a large kidney-shaped table about nine feet long. The teacher sits in the center of the kidney with eight children or so dispersed around the table, making it possible for her to work very closely with a small group engaged in advanced or remedial learning. Since Granada's big rooms contain no separate small-group space, the table, which is not located in a teaching station but in a niche near the library corner, serves as a substitute, those grouped around it forming an enclave within the larger space.

Another simple but ingenious device, designed by the architects and constructed locally, is a trapezoidal movable platform 90 square feet in area and 15 inches high. Each cluster has two, which can be used separately or joined together. When joined, they provide 180 feet of vinyl-covered surface in the form of a hexagon that fits neatly into the hexagonal-shaped teaching stations and common. The platforms lend themselves to, indeed invite, all kinds of imaginative use. They serve as an uncarpeted area for art and clay work (they are pushed up to the sink and children sit on top of them to paint), as a stage for skits, and as a display surface for art, science, or other exhibits that can be rolled around to the various teaching stations.

The best work-a-day arrangement to be recommended for getting the most out of walls is to have all free wall areas surfaced so they can receive stapled or tacked material. This, in combination with chalkboards and pegboard mounted on wall standards, renders virtually every inch of vertical surface in the room usable. A virtue of the boards so mounted, inci-

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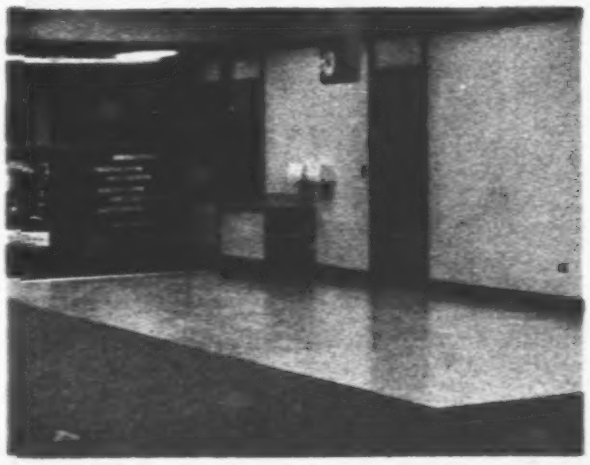
dentally, is that they can then be moved up and down or be interchanged; the interchangeability gives teachers the choice of how much of each they prefer.

No matter how much display surface there is, it never seems to be enough, so wall display areas can be supplemented by using supply cabinets and bookcases with display board attached to the back. Display or chalk panels that swing out on hinges perpendicular to the wall are considered undesirable, as they constitute sight barriers that interfere with the flexibility of the space.

In most open-room layouts there is a sink in each teaching station. In some cases there are additional sinks in the central common. (At the George Miner School they are exclusively located in the foyer which doubles as the small instructional and artwork room.) While some of the rooms are totally carpeted in disregard of the wetwork that goes on around sinks, in others the carpet stops and gives way to hard flooring. In the Faria and DeVargas Schools each station has an 8 foot by 16 foot tile surface around both the sink and the entrance. Similarly, the central common, where there are additional sinks for science work, has a 15 foot by 30 foot tile area surrounding them.



Whether to carpet throughout or leave patches of floor in strategic places with what is presumably a more utilitarian surface, is hard to say. But those schools that are totally carpeted have encountered no problems. With regard to both wetwork and other possible assaults on the soft floor, Principal Miriam Swett, of the Fairmont School, says: "It's been a surprise because it's been no problem at all and we've had every kind of childhood accident—bloody noses, wet pants, throwing up, spilt paint, and mud from the lack of landscaping. The custodians tell the teachers not to touch any of the spills. They have a special compound and they wait until a spill dries to clean it."

Dilworth, where the big room's fully carpeted floor is now in its fourth year, is still delighted with it. The only children's paint color that has refused to come out is violet. There, too, custodians let paint and other stains dry overnight before cleaning, though in the case of

poster paints teachers sop up spills immediately with detergent and water. Teachers feel this mild inconvenience to themselves is more than balanced by the carpet's virtues.

On the matter of routine maintenance, custodians assert that it is easier to care for the fully carpeted floor than one which combines carpet and hard flooring, since different equipment and processes are required for the different surfaces. At Granada it has been found that custodians can routinely clean the 5,000 square feet of carpet in the big room in half the time it takes them to clean 3,000 square feet of vinyl-asbestos tile in the kindergarten cluster. Moreover, they save two days of labor every 90 days when the carpet is spot-cleaned and the tile is stripped of old wax, rewaxed, and buffed.

A symbol of our times, perhaps, is the Granada custom of carpet cleaning after lunch. Until construction of the cafeteria is completed, lunch is eaten in the big rooms. At the end of the period, somebody gets the vacuum cleaner and vacuums up the crumbs, a chore rotated in the same way children are assigned the job of erasing the chalkboard.

THE HUMAN ELEMENT

Teachers and administrators who have had experience with open-plan schools are ready enough to point to the planners' hits and misses in assembling the physical components of the space—the virtues of carpet, the shortage of storage. But their over-all evaluation of the assembled space focuses not on physical considerations but on the impact the space has on the people who use it, and the latitude it gives them for experimenting with new pedagogic theories and methods.

Open space has, in fact, been so closely linked with educational innovation that many educators assume there is no point to an open classroom unless the program calls for team teaching, nongrading, or something similar, since without such a program the virtues of the space become irrelevant and its possible disadvantages paramount. Actually, the link is not so solidly forged. Open space not only works well when the program is self-contained, it even may be especially desirable because it is flexible enough to accommodate traditional schooling while pushing toward change in the future.

The George Miner School is a case in point. The present graded structure will eventually be dropped in favor of performance grouping by subject. (Children are already so grouped for reading.) The open classroom pods will then come into their own, allowing children to move readily from group to group within the room. In the meantime, though, the pods quite comfortably house self-contained classes, independently taught. And they are subtly nudging the teachers toward more joint planning, which will stand them in good stead when the nongraded structure is adopted.

In the case of the Fairmont School, the open plan was conceived as a catalyst for educational changes which Superintendent Fred Lucas felt were too slow in coming. To move things along, he arranged for board members, local newspaper people, and community leaders to visit nearby Dilworth. They were enthusiastic; Fairmont was planned as an open school, complete with team teaching; and the district wants more of the same. (Three new schools on the Fairmont pattern are in the works.)

Nevertheless, it is true that most of the open-plan schools discussed here have espoused open space not in anticipation of change but in direct response to the requirements of educational changes al-

ready planned or initiated. And here again, Dilworth is a prime exhibit. "Back in 1959, we were all in the Luther School [a conventional model]," explains Principal Jan Goss, "and the staff was dissatisfied. We wanted to try performance groupings that would cut across grade lines, but it was very difficult to do because the children had to move so much from room to room. Six children from one class would go to another room for arithmetic, five would have to go somewhere else for social studies—there was just too much confusion involved with all the shifting. So we wanted a large room where the children could remain in essentially the same place, yet shift for different ability levels.

"At the same time, we found ourselves in a curriculum explosion. All kinds of new things were developing, and the teachers needed teaching themselves. . . ." Some familiarized themselves with the new math; some studied Spanish; others took reading instruction courses and started a programed reading setup.

"All of this meant we needed a space where teachers could work together and learn from one another, where they could exchange new information, where they could arrange children in many different ways to try different kinds of instruction and different kinds of groupings."

The Granada School, too, was planned to permit the easy movement required by an educational approach stressing individual instruction via nongrading and team teaching, though here even more stress was placed on teacher-teacher relationships. One of the district's primary goals was to upgrade its teaching staff. Its view that teacher competency improves to the extent that there is interaction among the staff led not only to the open classroom clusters, but to a formal hierarchal teaching team as a device for inducting and training new teachers—and even to plans for building a teacher-education center on the site.

This emphasis on the professional development of teachers is a recurring theme in discussions of open space. As Mr. Boyd Morningstar, principal of the George Miner School, puts it: "A big room is a built-in in-service training program for teachers. Things come up in a classroom that can cause a new young teacher to go to pieces or to run to the principal for help. But when you put brand-new teachers in the same room with veterans, the young ones learn quickly from their more experienced colleagues how to handle disciplinary problems or unusual situations. They learn just by seeing the others in action.

"And the older teachers, the ones who've been at it for 12 or 15 years, learn new methods and get fresh ideas from the novices just out of school."

From the teacher's point of view, a major asset of working in an open classroom is that she is no longer a Gulliver in Lilliput, marooned in a world inhabited solely by people three feet high. Instead of being encased in the same room with the same group of children all day every day, teachers can enjoy the society of other adults, finding stimulation and moral support in the closer association with their colleagues. As a result, they say, they are better with the children during the time they spend with them.

Other advantages cited by teachers center around more purely professional considerations. Because teachers can be relieved of teaching subjects they dislike or in which they are not strong, and given more time to strengthen their special interests and skills, better use can be made of available teacher talent. Because each teacher need not plan for all subjects, each is free to develop better presentations, covering material in more depth. And the over-all joint planning, teachers agree, tends to be not only more thorough but more imaginative. As Dilworth's Mrs. Schneider put it: "One teacher starts out with an idea, somebody else starts out with another one, and often the combination is better than either."

The sum of all this is a greater sense of professionalism on the part of teachers, who jointly assume responsibility for developing, planning, evaluating—and if

need be, changing—their own programs and ways of working. Mrs. Miriam Swett, principal of the Fairmont School, notes, for example, that she finds the open-plan building easier to administer than a conventional building because the teachers are so much more involved with the program. This leaves her more time to work on curriculum and to teach once or twice a week herself.

And it should, perhaps, also be noted that while joint planning and shared responsibility are attributes of team teaching, whatever the setting, the interaction fostered by an open classroom is an asset to teachers even when there is no actual team arrangement. At the George Miner School, each teacher has her own class in the open space. Yet as one teacher reports: "The room turns out to be a real time-saver. I was going to start on a mental-health unit with my class and postponed it because I couldn't get around to making the charts I needed for it. Then the teacher in the next station began a health unit with her class and she'd already made the charts. All I had to do was borrow them, not spend hours making them."

The benefits an open setting confers on teachers are closely interwoven with corollary advantages to the children. Clearly if it is important that no single teacher be required to sustain the emotional burden of any particular child and his special problems all day long, it is equally important for the child to have a choice of teachers he knows and is known by, and to be free to seek out those with whom he feels an affinity. Children as well as teachers are better able to tolerate personality clashes because they are together for shorter periods of time. In a self-contained room the child can sometimes be the victim of one teacher's bias or poor judgement. Or, if the child is quiet, passive, and presents no special problems, he may simply be overlooked in a group of 30 children. But when a group of teachers works jointly with the youngsters in an open classroom, they can pool their observations and judgements about each child, one picking up things another misses.

By the same token, if the pooling of talent in a big room helps each teacher to improve her own performance, it also helps assure that each child receives higher quality instruction. Children in an open room benefit from having teachers who excel in different subject areas—and have time to prepare effective presentations; who employ different teaching approaches—and have time to work with children individually as well as in groups. (The Granada School formalizes this aspect of teacher interaction by making team assignments for each cluster on the basis of, among other things, "differing yet complementary subject matter competencies" and "differing yet complementary methodological competencies," e.g., pupil assessment, group management, and so on.)

Many teachers feel that the children also benefit from the example of seeing adults working together to solve problems (though Fairmont's Mrs. Swett wonders how children who are constantly exposed to joint decision-making develop an understanding that major decisions in life are always made alone), and from the stimulation of being with other groups of children (though the stimulation can be overdone, as in the case of immature children who sometimes need more privacy and calm).

But the primary benefit an open classroom setting offers children is the freedom to move from group to group for different levels of work. This mobility is important not only academically, but physically and psychologically as well. For movement is natural to children, and as James Grand, former principal of the Lewis Sands School, says: "It's time we built buildings that take into account human nature."

In an eloquent summation of the case for open space (at least from a child's-eye view), he continues: "For a long time, schools have been built to please board members or architects, not children. The self-contained classroom is unreal. It is the only place in our whole

society where one person has supreme authority over 30 other people—children—for most of their waking hours.

"When I go from the Little Red Schoolhouse to the self-contained rooms in the main building, I find the atmosphere there dull by comparison. This is no reflection on the teachers because there are exceptionally good teachers in both places. But the open-space building is not prisonlike. It doesn't subject the children to the influence of any one person for too long. It gives them the protection and interaction of many adults. It exposes them to a variety of personalities and activities and experiences. It permits them to move and gives them places to go. The whole atmosphere is more relaxed—and the children are twinkly and alive."

On the basis of the admittedly limited experience to date, it appears that openness works well with all age and grade levels, although some combinations may work better than others. For example, Dilworth principal Jan Goss notes that, among the second- and third-grade youngsters who occupied the big room the first year, there was a small group of immature second-graders who were not able to take full advantage of the big room program because they needed special help in all academic areas and could not cut across grade lines as could the other children. Succeeding combinations of third- and fourth-graders, and fourth- and fifth-graders were selected more successfully. At the Fairmont School, teachers in the primary wing report that beginning children were confused at first by being shifted among the four teachers, so next year each teacher will work with his own group for a longer period before starting to shift them. But the teachers also feel that the first- and second-grade combination is basically sound, and that when first-graders did begin to feel comfortable with grouping and regrouping, they benefitted from being with more mature second-graders.

At the other end of the age spectrum, Fairmont and George Miner, both K-8 schools, report that their open plans are especially good for the seventh- and eighth-grade groups. Separating them from the rest of the school and exposing them to more than one teacher helps prepare them for high school, serving in lieu of a junior high.

Open space is not, of course, without drawbacks. Most can be overcome, or at least the symptoms relieved. Noise and other distractions can be kept in reasonable bounds by proper physical planning (with special attention to acoustics), careful scheduling, and, above all, by not overcrowding the room. The lack of privacy can be compensated for by providing appropriate adjunct spaces, or making it possible to separate off at least part of the room part of the time. And some liabilities attributed to open-plan schools are really the result of team-teaching arrangements and not of open space as such. As noted earlier, a frequent complaint about open space is the constraint imposed by the need for sticking to a predetermined schedule, and the resulting loss of flexibility of time. Yet at a school like George Miner, where there is no formal team teaching as yet and only special activities are planned jointly, scheduling is not a major consideration, let alone a major problem.

It would seem that the debits against open space are more than balanced by the credits in its favor. But the ledger does not tell the whole story. For even the most dedicated proponents of open-plan schools agree that open space is not for everybody. "I wouldn't put just anybody in this type of room," cautions Mr. Morningstar of the George Miner School. "Wouldn't put a prima donna in, has to be someone who can give and take. You can't have someone who says 'I've been teaching 20 years and I know.' Some teachers are excellent but just couldn't be in a room like that because they have their own way of doing things and like their privacy. And the main thing is that the teachers have to get along."

Fairmont's Mrs. Swett agrees that teachers are the key to success in an open setup. An open room, she says, "should have only teachers who *want* to be there, who welcome new experience, are not afraid to make mistakes, have a capacity for excitement, are somewhat nonconformist—and are child-centered. You cannot have people whose security rests on four walls; they must have security inside themselves."

Certainly there are few teachers with enough inner security to say with Cynthia Piai, a teacher at the Lewis Sands School: "Sometimes the children become interested in what the neighboring teacher is saying and their attention wanders from me. But then, my feeling is that they may be hearing something more valuable or more interesting than what I'm saying so maybe they're getting more out of *not* listening to me. If it happens a lot, it's a signal to me that I'm getting dull and may have to rearrange my own presentation or method of work."

However, the faculties of the now-existing open-plan schools do have enough inner security to meet Mrs. Swett's specifications for big-room teachers. Whatever their early misgivings about working in a fishbowl, they have since become open-space enthusiasts whose main worry is being sent back to a self-contained building.

This was not accomplished by accident. Knowing that no innovation in plant or program has a chance of success unless teachers are willing and able to accept it, the districts that have built open-plan schools have taken pains to staff them with people who want to be there. Almost all of the teachers in these schools are volunteers, and in cases where the adoption of open space was accompanied by the introduction of new teaching techniques, they are frequently also alumni of more or less formal teacher-training programs. Many of the schools have drawn on Dilworth's experience in preparing their teachers as well as in planning their open teaching spaces.

As open-plan schools spread up and down the West Coast and eastward across the country, they are also making forays above the elementary school level. In addition to K-8 schools like Fairmont and George Miner, several junior high schools in the San Francisco area have already added open classroom clusters to house teacher teams responsible for such subjects as science and social studies. At least one open-plan high school, the Clarksville (Tennessee) Senior High School, designed by architect John Shaver, is now under construction.

How well these open-plan secondary schools will function remains to be seen. But at the lower levels, at any rate, the success of schools without walls ultimately depends on people. As Superintendent Charles Knight of the Cupertino Union School District (which includes the Faria and DeVargas Schools and an open junior high addition as well as Dilworth) puts it, "Making open space work takes constant work." Without an enthusiastic, well-prepared teaching staff, headed by a principal who can provide strong leadership, he says, its promise of new opportunities for better education will remain just that: a promise.

MARGARET FARMER/RUTH WEINSTOCK

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